

The 3rd International Symposium on Culture Technology



August 24~25, 2026
BUSAN, KOREA



International Association for
Convergence Science & Technology



Contents

01 Welcome Message	1
02 Congratulatory Message	3
03 ISCT2026 Program	5
04 Keynote Speech	6
• Culture, Convergence, and Education	6
(Dr. Pyeoungkee Kim, Silla University, South Korea)	
05 Lecture	20
• Beyond Bilateral Trade:Building the Indonesia-South Korea Co-Creation Engine	20
(Dr. Rolly Intan, Petra Christian Univ., Indonesia)	
• A Multilingual Companion Active Hub for Older Adults	29
(Dr. Lee Yun Li, Sunway Univ., Malaysia)	
• Culture Technology at Sunway University	39
(Dr. Sian Lun Lau, Sunway Univ., Malaysia)	
• AI-based Research Trends in Thailand & Future Prospects	52
(Dr.Thepchai Supnithi,, NECTEC, Thailand)	
• An AI-Powered Cultural Intelligence Atlas for Culinary Heritage	75
(Dr. Mustafa Eren Yildirim, American Univ., Malta)	
• From 3D Skeletonization to Extended Reality: A Research Journey Towards Malaysia-Korea Collaboration in Culture Technology	87
(Dr. Seow Saw Hui, Universiti Tunku Abdul Rahman(UTAR), Malaysia)	
• AI for Inclusive Care: Understanding and Monitoring Challenging Behaviors Beyond the Classroom	92
(Dr. Yoosoo Oh, Daegu Univ., South Korea)	

Welcome Message

Distinguished guests, esteemed colleagues, and dear students
Good morning, and a warm welcome to Busan.

On behalf of the International Association for Convergence Science and Technology (IACST), it is my distinct honor to welcome you to the 3rd International Symposium on Culture Technology.



DongKyun Kim
President of IACST

First, I would like to begin by thanking those who have made this gathering possible. Dr. Kwangyun Wohn, Advisor to IACST and Professor Emeritus at KAIST; President Jekuk Chang of Dongseo University, our gracious host; Dr. Pyeoungkee Kim, Chairman of the IACST Board; and our colleagues who have traveled from Thailand, Indonesia, Malaysia, and Malta, thank you all for being with us today. To our international guests, thank you especially for making the long journey. Your presence is precisely what makes this symposium a truly global forum.

IACST was founded upon a simple conviction: that the most pressing questions of our time cannot be answered by any single discipline in isolation. Science, technology, art, and the humanities have long spoken different languages. Our mission is to bring them into a shared dialogue – through our journal *IJCT*, our flagship conference *ICCT*, and this very symposium, *ISCT*.

If *ICCT* serves as the stage where we present our findings to the world, *ISCT* is where we gather more closely and converse more candidly – about our ongoing work, our remaining challenges, and the possibilities we might build together. That spirit of close collaboration defines the purpose of today.

We convene at a pivotal moment of transition.

In just a few short years, generative AI has evolved from a research curiosity into an essential tool in studios, classrooms, and laboratories worldwide. It is fundamentally reshaping how images are created, how narratives are woven, and how culture itself is produced and disseminated.

This shift raises questions that are profoundly technical – yet extend far beyond technology itself:

- What does authorship mean when a machine participates in the creative process?
- How can local cultures preserve their distinct voices within globally trained models?

- And how do we prepare our students for careers whose future forms we cannot yet fully envision?

Today's program addresses these questions with the seriousness they demand. We will feature a keynote on the evolving role of culture and culture technology, a session dedicated to generative AI-driven video production, and – most importantly – presentations and demonstrations led by our graduate students. I encourage you to give their sessions your fullest attention; they are not merely the future of this field but are actively shaping it today.

Furthermore, this symposium is designed to yield enduring outcomes.

This morning, our colleagues from Indonesia, Thailand, Malaysia, and Malta will present concrete proposals for international cooperation.

Later today, we will formally launch the Global R&D Council under the Global Support Department of the Dongseo University Anchor Project Group – in partnership with IACST, Daegu Catholic University, Kyungpook National University, Daegu University, Petra Christian University, Chiang Mai University, NECTEC, American University, and Sunway University. This landmark event will be followed by the official declaration of our Global Collaborative Research Flagship Initiative.

International partnerships are frequently announced, yet seldom sustained. The commitment we make through the launch today is intended to endure far beyond the ceremony – through shared projects, shared mentorship, joint research funding, and tangible outcomes.

Today also marks our working session for ICCT 2026 in Shanghai, under the overarching theme *Culture in the AI Era*, as well as the 2nd Asia AI Film Festival. Your insights and contributions over these two days will directly inform both milestones.

Busan is a historical port city – a place where diverse cultures arrive from afar, converge with the local heritage, and catalyze something genuinely new. I can conceive of no finer setting for a symposium dedicated to convergence.

My hope for today is therefore simple, yet profound: that each of you leaves this room with at least one new collaborator you did not have this morning and one breakthrough idea you could not have conceived alone.

Thank you very much, and I wish you an inspiring and memorable symposium.

Congratulatory Message

It is my great honor and pleasure to extend my sincere congratulations on the successful opening of the 3rd International Symposium on Culture Technology (ISCT).

It is particularly meaningful to welcome distinguished professors, researchers, and experts from around the world to Dongseo University. The symposium was previously held at our Centum Campus in 2017, and I am delighted that, nearly a decade later, we once again have the privilege of bringing together leading scholars and experts from various countries at Dongseo University.



Jekuk Chang
President
Dongseo University

On this occasion, I would like to express my deepest appreciation to Dr. Dong Kyun Kim, President of the International Association for Convergence Science and Technology (IACST), and to all those who have devoted their time and efforts to organizing this important symposium. I would also like to extend my sincere gratitude to the Regional Directors (RDs), as well as the professors and staff of Dongseo University's Anchor Project Team, for their invaluable contributions to this event.

It is particularly significant that this symposium is being held in Busan, one of Asia's leading cities for film and cultural contents, and at Dongseo University, which has established a strong reputation in the fields of film, video, and cultural contents education.

While our Centum Campus serves as an important hub for the production, education, and development of film, video, and cultural contents, our Jurye Campus serves as the heart of Dongseo University's technological innovation and global cooperation.

Through our key R&D initiatives, including the Institute of Virtual Technology Convergence, as well as our International College, Dongseo University is actively pursuing advanced research and education while strengthening global partnerships with universities and research institutions around the world.

In this context, I believe that today's symposium carries particular significance as a strategic platform for convergence, bringing together cutting-edge technologies, cultural contents, and global academic networks to explore new possibilities and shape the future of interdisciplinary collaboration.

We are living in an era of profound digital transformation, in which artificial intelligence is fundamentally reshaping our society and the way we live, work, communicate, and create.

AI is no longer simply a technological tool. It is increasingly influencing the very

nature of creativity, artistic expression, and human communication.

Against this backdrop, I believe that the importance of Culture Technology, or CT, is becoming greater than ever. Culture Technology serves as a bridge between advanced technology and human emotion, artistic imagination, and creativity.

No matter how rapidly artificial intelligence advances, it is ultimately human beings who determine what moves us, what inspires us, and what kind of future we wish to create.

For this reason, I believe that AI should not be regarded simply as a competitor to human beings. Rather, it should be understood as a partner capable of expanding human imagination and creativity. Culture Technology, in this sense, provides an important foundation for bringing technology and humanity together in a more meaningful and productive way.

I sincerely hope that the distinguished scholars and experts gathered here today will engage in thoughtful and inspiring discussions that transcend the boundaries of individual disciplines and academic fields. I am confident that your insights and exchanges will generate innovative ideas and lead to new opportunities for international academic cooperation in the field of Culture Technology.

Dongseo University is also deeply committed to contributing to the development of this dynamic field. We look forward to continuing our close cooperation with the International Association for Convergence Science and Technology, bringing together technology and culture, as well as the arts and humanities, to advance interdisciplinary research and education.

Once again, I would like to extend my sincere appreciation to all the distinguished scholars, researchers, experts, and guests who have honored us with their presence today.

I sincerely hope that the 3rd International Symposium on Culture Technology will serve as a meaningful platform for academic exchange and international cooperation, and that it will provide each of you with new inspiration, valuable insights, and opportunities for future collaboration.

On behalf of Dongseo University, I wish the symposium every success and all participants a most productive and rewarding experience.

I also wish each and every one of you continued success and prosperity in your academic and professional endeavors.

Thank you very much.

ISCT2026 Program

Date	Time	contents		Etc.
8/25 (Tue)	10:00	Opening Ceremony & Introduction Guests		Moderator
	10:05~10:20	Welcome & Congratulatory Remarks		Dongkyun Kim (President of IACST), Jekuk Chang (President of DSU) Emeritus Prof. Kwangyun Wohn (KAIST)
	10:20~11:00	Keynote Speech : Culture, Convergence, and Education		Pyeongkee Kim (Former Vice President of Silla Univ., IACST Chairman)
	11:00~11:20	Session 1	Beyond Bilateral Trade:Building the Indonesia-South Korea Co-Creation Engine	Rolly Intan (President of PCU)
	11:20~11:40		A Multilingual Companion Active Hub for Older Adults	Prof. Yun Li (Sunway Univ.)
	11:40~12:00		Culture Technology at Sunway University	Prof. Sian Lun Lau (Sunway Univ.)
	12:00~13:30	Lunch Break		
	13:30~14:00	Tour of IC(International College) facilities & Virtual Reality Convergence Center		Prof. Tae Soo Yun (DSU, Head of Global Support Dept. at ANCHOR)
	14:00~14:30	AI Film Presentation & Screening		Prof. Zhou Ziani (Dongse Univ)
	14:30~14:50	Session 2	AI-based Research Trends in Thailand & Future Prospects	Thepchai Supnithi, Principle Researcher of NECTEC
	14:50~15:10		An AI-Powered Cultural Intelligence Atlas for Culinary Heritage	Prof. Mustafa Eren Yildirim, (American Univ. of Malta)
	15:10~15:30		From 3D Skeletonization to Extended Reality: A Research Journey Towards Malaysia-Korea Collaboration in Culture Technology	Prof. Seow Hui Saw (UTAR)
	15:30~15:50		AI for Inclusive Care: Understanding and Monitoring Challenging Behaviors Beyond the Classroom	Prof. Yoosoo Oh (Daegu Univ.)
	15:50~16:00	Tea Break		
	16:00~16:15	The Vision & Global R&D Collaboration Strategies of IACST		Prof. Dongkyun Kim (President of IACST)
	16:15~16:30	Anchor Project & Strategies for Enhancing Global Competitiveness of Regions and Universities		Prof. Tae Soo Yun (DSU, Head of Global Support Dept. at ANCHOR)
	16:30~16:40	TFT Launch	Launch of the Global R&D Council by DSU Anchor Project Team (Global Support Dept.)	
	16:40~17:00		Global Joint Research Flagship Project Initiative	
	17:00~20:00	Networking Session		

Session 1

**Keynote Speech :
Culture, Convergence, and Education**

(Dr. Pyeoungkee Kim, Silla University, South Korea)

ISCT2026 - KEYNOTE

Culture, Convergence, and Education

Order, Beauty, and Meaning
in the Age of Intelligent Machines

Professor Pyeoungkee Kim · IACST

01

OPENING

If nature disperses possibility, why do humans create order and beauty?

And why do we keep creating order, beauty, play, and meaning?

NATURE		HUMANITY		CULTURE		TECHNOLOGY		EDUCATION
dispersion	→	coordination	→	meaning	→	amplification	→	renewal

02

NATURE
CHAPTER 01

NATURE

Possibility tends to disperse.

Entropy gives physical direction to time
— but not a moral direction to life.



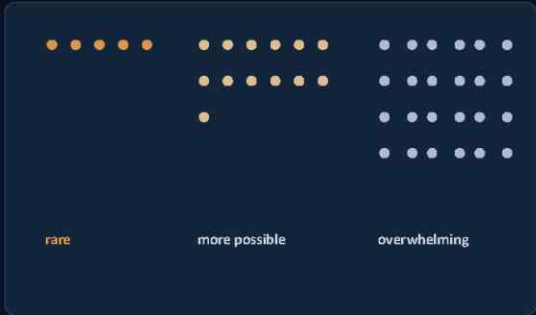
03

NATURE

Entropy is about multiplicity—not simply “mess.”

$$S = k \ln W$$

W = number of microscopic arrangements compatible with what we observe



rare more possible overwhelming

The second law is statistical: macroscopic systems move toward states with vastly more available microstates.

04

NATURE

The arrow of time points toward **equilibrium**.



“Heat death” is a long-range cosmological scenario under current assumptions
— not a near-term prediction.

05

NATURE

Life creates **local order** by remaining open.

ENERGY + MATTER



HEAT + ENTROPY



Birth-to-death is not a simple entropy meter.
Aging is better understood as a **changing capacity** to maintain organization.

06

HUMAN

CHAPTER 02

PERSON · HUMAN · ORDER

Each person is unique. Human life is shared.

The central human problem is
how singular lives can flourish together.



HUMAN

AN ANCIENT COUNSEL

Eat. Love. Play—rejoice.

Siduri's counsel to Gilgamesh

A modern synthesis—not a direct quotation

SOCIALITY	life with others
PLAY	shared joy and creation
ORDER + HARMONY	norms for coexistence

Shared play needs norms and institutions that
protect order and harmony.

HUMAN

Human nature combines individual drives, sociality, and beauty.



09

HUMAN

Order and Beauty align human potentials toward shared flourishing.



Order and beauty restrain harm while sustaining cooperation, creativity, and beauty.

10

HUMAN

Order makes plural forms of play possible.

WITHOUT ORDER

collision

The strongest impulse sets the rules.

WITH ORDER

coordination

Different lives can share a world.

AS CONDITIONS CHANGE

renewal

Rules must learn without collapsing.

"Reducing social entropy"

A metaphor for reducing destructive uncertainty
—not a thermodynamic measurement.

11

CULTURE

CHAPTER 03

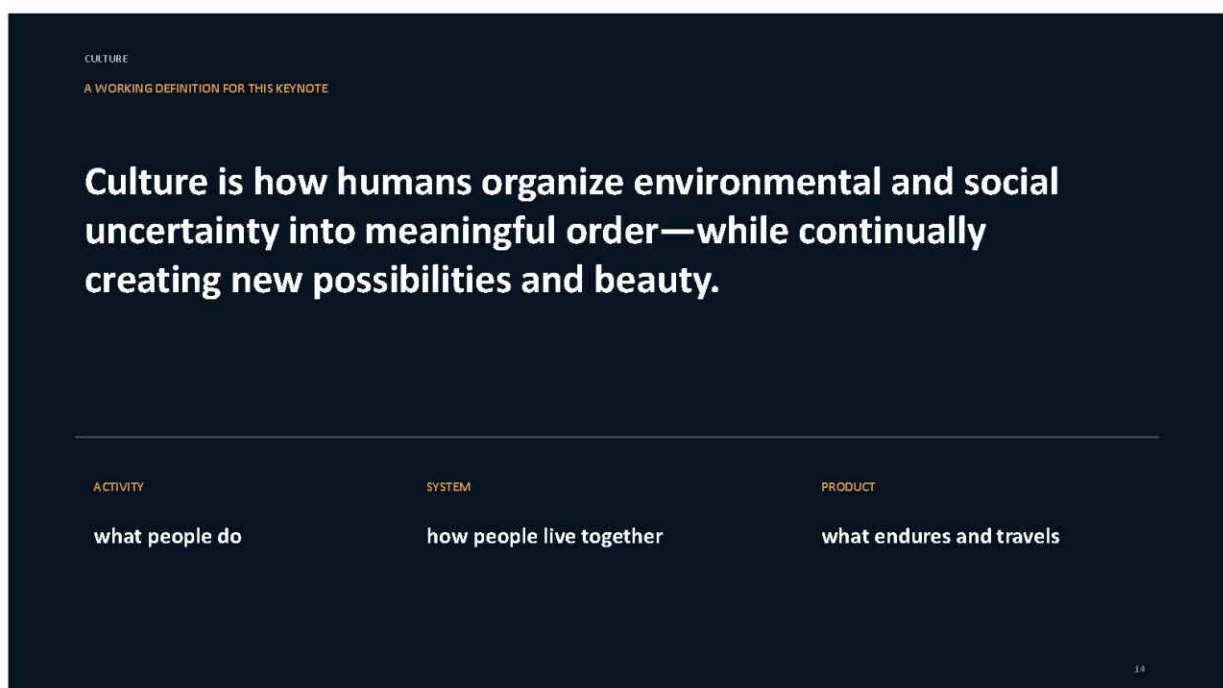
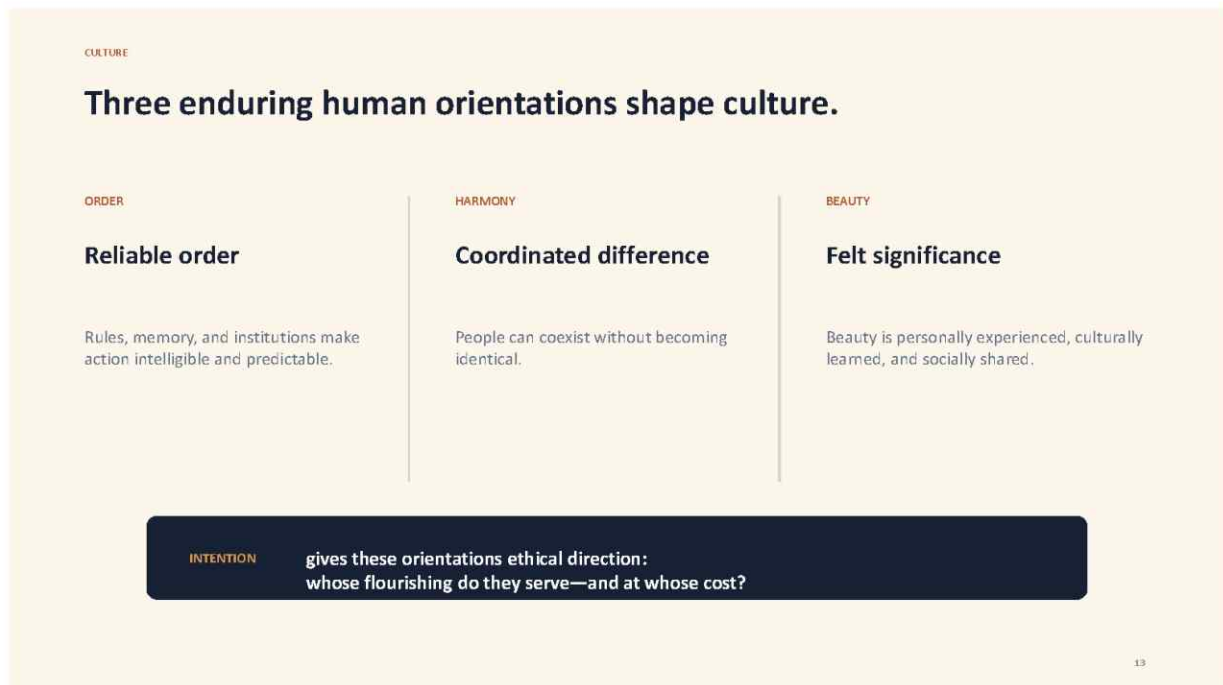
CULTURE - CULTURE TECHNOLOGY

Order and beauty meet new possibilities.

Culture preserves a shared world while making room for worlds not yet imagined.

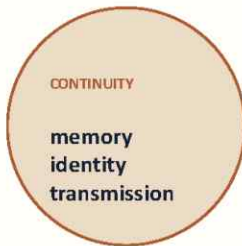


12



CULTURE

Culture holds continuity and novelty in tension.



Too much continuity becomes rigidity. Too much novelty becomes noise.

15

CULTURE

A BROAD DEFINITION

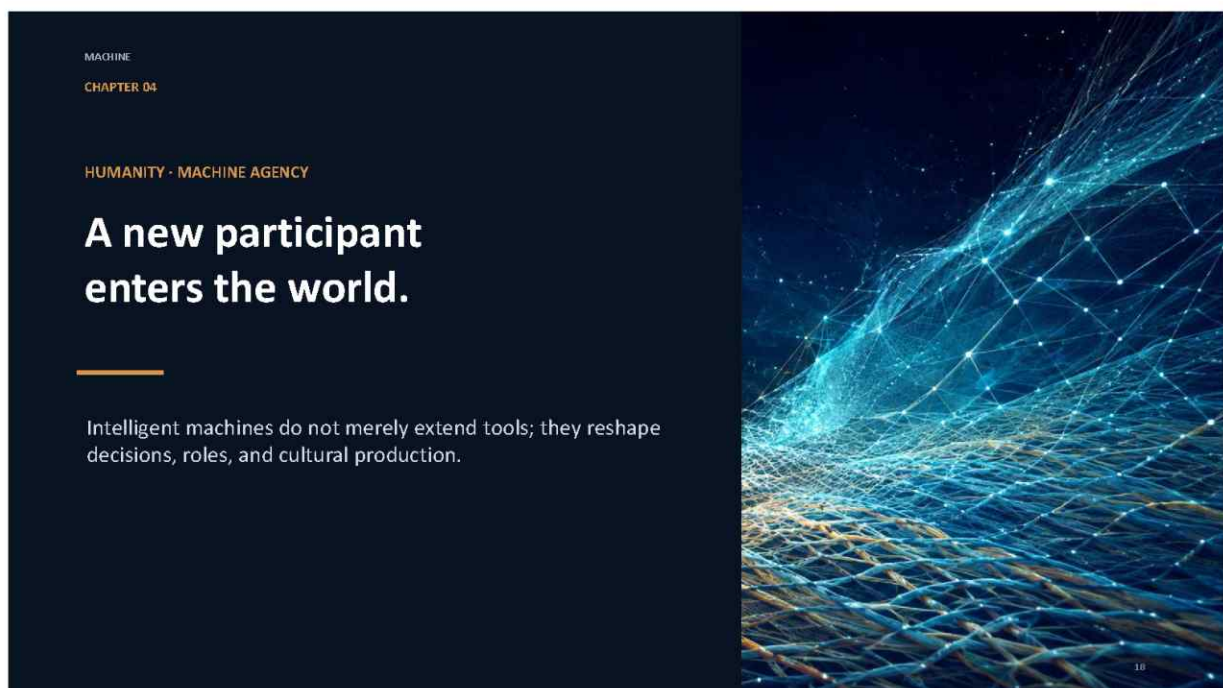
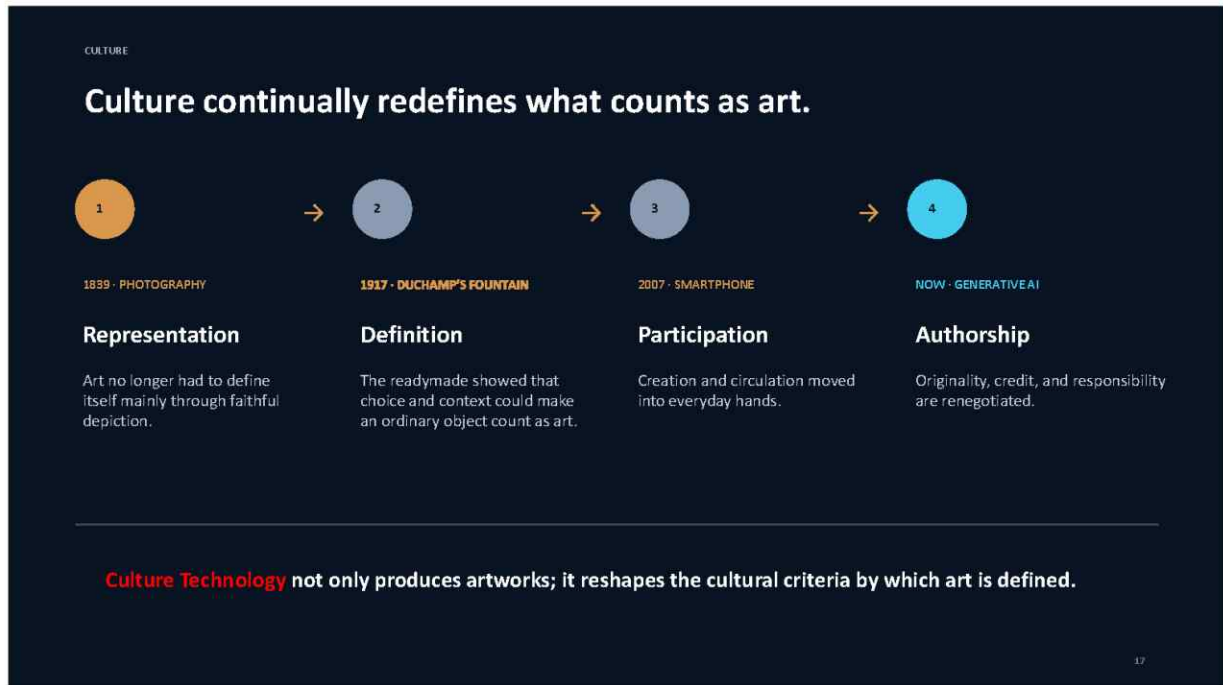
Culture Technology

encompasses interdisciplinary and convergent human efforts that apply technological knowledge and practice to the creation, development, and advancement of creative and aesthetically meaningful culture.

TECHNOLOGY IS NOT THE SUBJECT.

It is a method, medium, infrastructure, and partner in cultural creation.

16



MACHINE

When connections change, the world changes.



The key question is no longer only what technology can do—but what kind of relationship it creates.

19

MACHINE

From Heaven · Earth · Human to Heaven · Earth · Human · Machine



A proposed **four-part frame for culture** in the age of intelligent systems

20

MACHINE

Humanity and machine agency must be studied together.

HUMANITY	SHARED QUESTIONS	MACHINE AGENCY
embodiment mortality care responsibility	Who decides? Who is accountable? Whose values persist? What remains human?	computation scale replication autonomy

Human judgment and oversight remain essential as machine agency grows.

21

EDUCATION
CHAPTER 05

CULTURE · EDUCATION · CONVERGENCE

Teach people to find what matters.

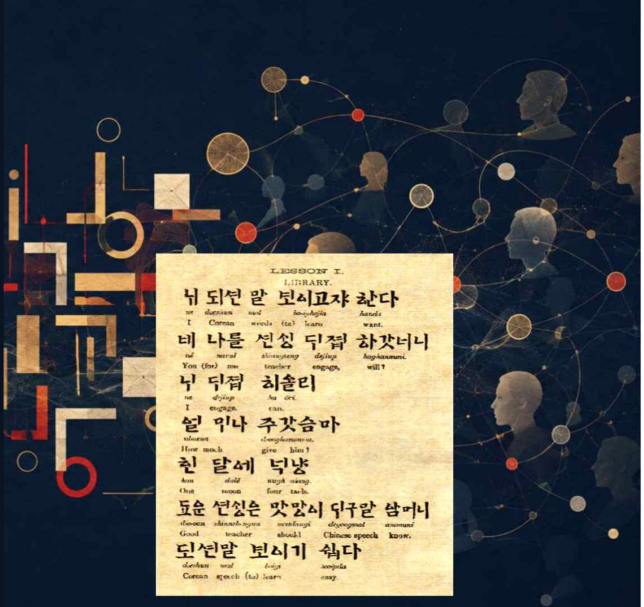
When machines solve more given problems, human contribution moves upstream—to framing, meaning, and responsibility.



EDUCATION
A KOREAN CASE

Hangul: good intention became cultural technology.

- 1 INTENTION** Enable ordinary people to express the mselves.
- 2 PROBLEM** Imported characters did not fit spoken Korean well.
- 3 DESIGN** 28 learnable letters: completed 1443, promulgated 1446.
- 4 CULTURE** Expression and knowledge became more broadly shareable.
- 5 CONVERGENCE** Cultural convergence brought creativity to fuller realization.



Corean Primer, by John Ross (Scotland), 1877

23

EDUCATION

Convergence = opening boundaries + aligning purpose

融 RONG · 融

Boundaries become permeable.

Disciplines, methods, and assumptions soften enough to interact.



合 HE · 合

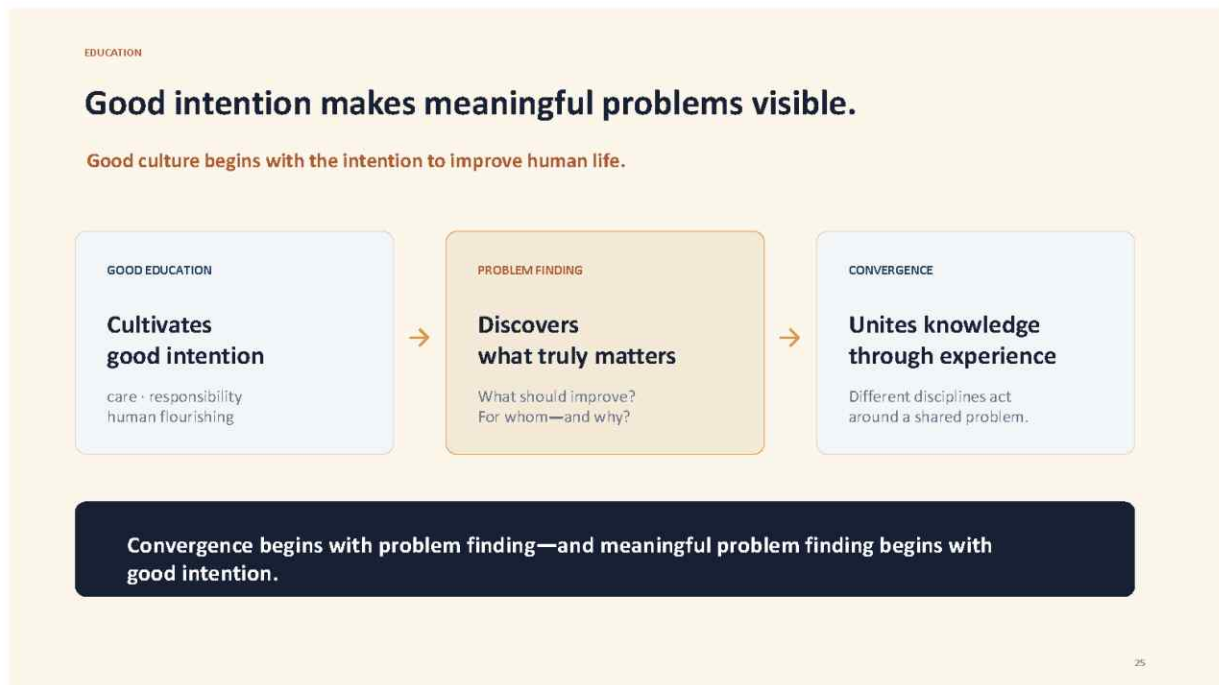
Differences align around shared intention.

People, contexts, and consequences meet around what truly matters.



Convergence is purposeful cooperation—not mixing for its own sake.

24



CLOSING
THE CLOSING THESIS

Culture is humanity's way of turning uncertainty into shared meaning—without closing the future.

Culture Technology expands humanity's capacity to create.

Education is one of humanity's most powerful **cultural practices**—enabling us to understand culture, master Culture Technology, and create and transmit better culture.

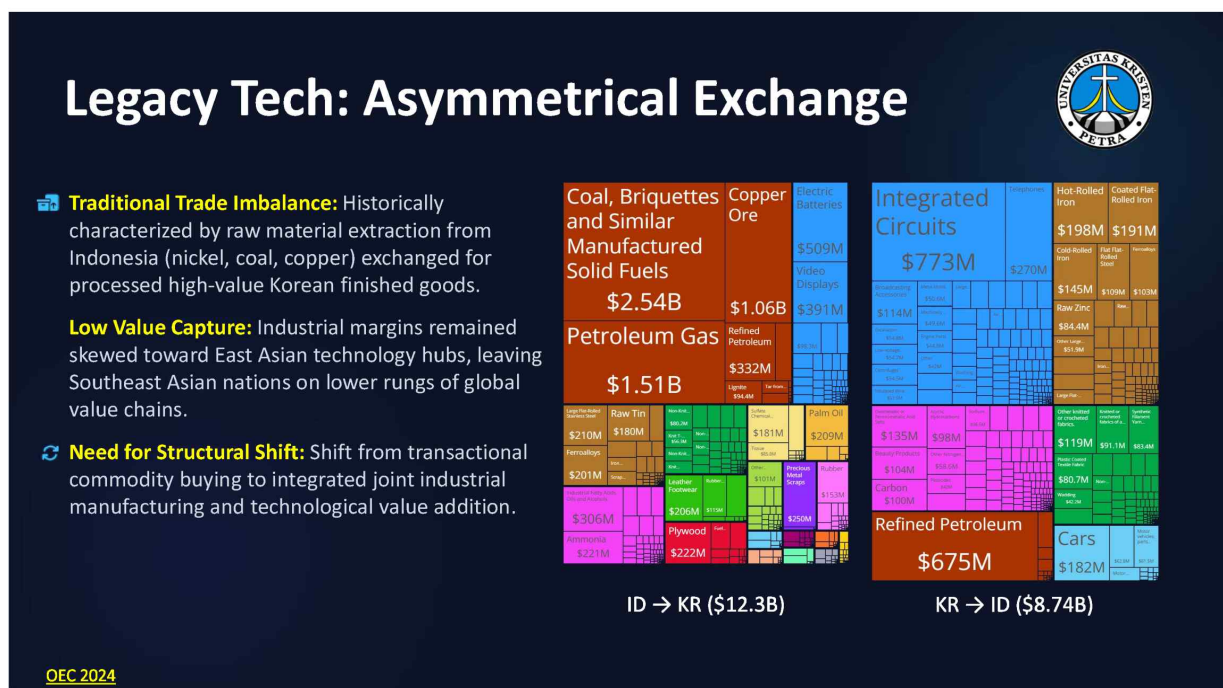
OUR SHARED MISSION
Cultivate and share the wisdom to discern what matters, ask the right questions, and take responsibility—guiding culture and Culture Technology toward human flourishing.

26

Session 1

**Beyond Bilateral Trade: Building the
Indonesia-South Korea Co-Creation Engine**

(Dr. Rolly Intan, Petra Christian Univ.,
Indonesia)



Legacy Culture: One Way Export



- Unidirectional Cultural Waves:** Hallyu (K-Pop, K-Drama, Webtoons) achieved massive penetration in Indonesia, but primarily as a consumer export model.
- Untapped Co-Production:** Rich Indonesian folklore, creative talent, and regional media IP remained largely unintegrated into global distribution pipelines.
- The Modern Requirement:** Evolving from content consumer to co-producer through joint IP creation and transnational film studios.



Overseas Hallyu Survey 2026

Why the Legacy Model Fails

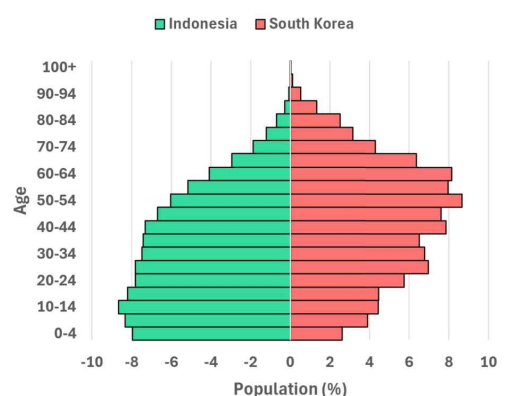


South Korea: Demographic Ageing

Inverted demographic pyramid, shrinking domestic labor force, and urgent market saturation necessitating external manufacturing bases and young consumer scale.

Indonesia: Young Demographic & Policy Shift

Median age of ~30 years combined with strict "Mineral Down streaming" national mandates ban raw ore exports, requiring foreign tech partnerships inside Indonesia.



UN WPP 2024

Joint Industrial Integration: The Karawang EV & Battery Ecosystem

PT HLI Green Power Gigafactory

Karawang facility represents East Asia's first integrated EV battery plant in Southeast Asia, uniting Hyundai, LG Energy Solution, and local mineral supply chains.

- ✓ 10 GWh battery cell capability powering ASEAN EV fleets.
- ✓ Direct integration of down streamed Indonesian nickel.

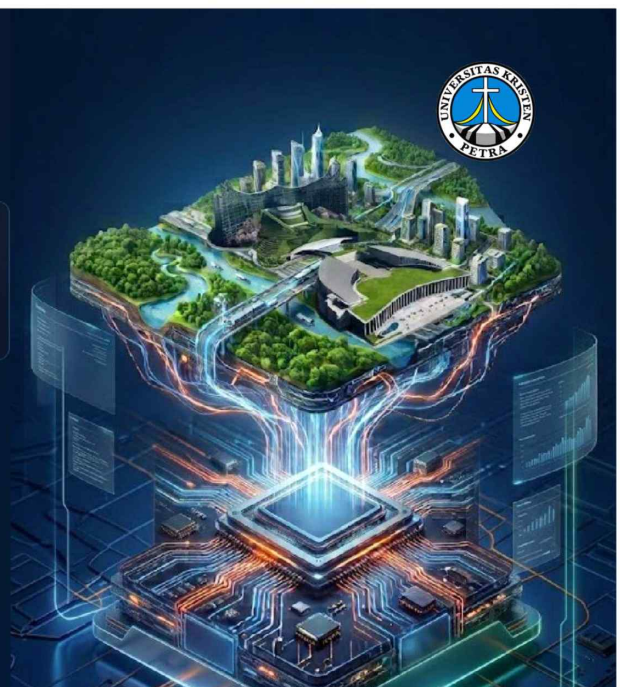


AI Computing & Smart Cities

Nusantara (IKN) Smart City Center

South Korea and Indonesia joint development of the Smart City Cooperation Center (SCCC) in Nusantara, incorporating AI robotics, digital twin urban management, and green transit protocols.

-  **AI & NPU Infrastructure:** Deploying energy-efficient Neural Processing Units (NPUs) for real-time traffic, power grids, and IoT governance.
-  **Knowledge Transfer:** Multi-university capacity building and technical standard standardization.



Transnational Media & Film IP

- Joint Studio Co-Production:** Strategic alliances between Korean entertainment powerhouses (CJ ENM, webtoon studios) and Indonesian filmmakers in Jakarta.
- Local IP with Global Reach:** Adaptations of Indonesian storytelling into high-budget streaming series and animated webtoons for worldwide distribution.
- Post-Production Innovation:** Joint VFX, AI dubbing, and virtual production infrastructure across Seoul and Jakarta hubs.



Institutional Co-Creation in Action

King Sejong Institute at Petra Christian University

King Sejong Institute at Petra Christian University serves as a living laboratory for co-creation.

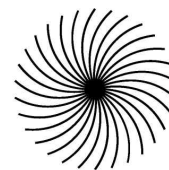




수라바야 세종학당의 역사

History of King Sejong Institute

Surabaya



The First Step(첫걸음): 2015



- **Initiators :**
Prof. Rolly Intan (Petra) & Prof. Jekuk Chang (DSU)
- **First Director :**
Dr. Liliek Soelistyo, M.A.
- **Officially Established :**
August 10, 2015, at Petra
- **First-Year Students :**
66 students





2016

Growing Roots(뿌리 내림)

284 Students Enrolled



2017

Building Bridges(다리 만들기)

- Multimedia Room Established (Korea Information Technology Agency & Korea Network Industry Association)
- Korean Movie Day 2017

2018 - 2019

The Journey Continues (계속되는 여정) and Expanding Horizons (시야 확대)

- Expansion of Korean Cultural Events
- Classroom & Library Expansion (KSIF Renovation Project at PCU)
- Total Graduates: 1,000+
- Partnership with Middle & High Schools



2020 - 2022

Facing Challenges with Resilience (위기를 견디고 다시 일어서서)

- Online Classes & Events
- Oesolhoe Scholarship Program
- Expansion of Student & Alumni Networks
- Total Students: 4,000+



2023

Beyond Borders(경계를 넘어 넓은 세상으로)

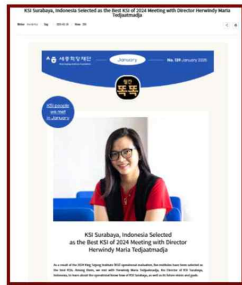
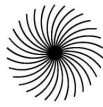
- Second Director: Herwindy Maria Tedjaatmadja, MA-ELT
- Award of Excellence from KSIF
- KSIF Project: Mentoring 3 KSI in other countries

2024

Embracing Responsibility (주어진 사명과 책임을 받아들이며)

- Meritorious Service Award from KSIF
- Strengthening the Indonesian KSI Network (KSIF Project)



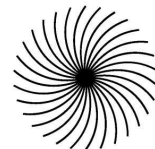


2025 - Now
A Legacy in Motion (이어지고 발전하는 유산)

- Featured in the KSI Foundation Bulletin & Arirang — **Best KSI of 2024**
- Additional Teachers' Room at Petra
- Korean Language Classes for PT Prima Duta Sejati
- Third Director: Dr. Listia Natadjaja, S.T., M.T., M.Des.



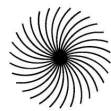
KSI Surabaya Events



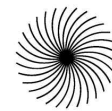
Korean Movie Day (한국 영화의 날)
 Korean Culture Program (한국 문화 프로그램)
 Korean Speaking Contest (한국어 말하기 대회)

Sejong Culture Academy (세종 문화 아카데미)
 Korean Culture Day (한국 문화의 날)
 Completion Ceremony (수료식)





함께 한 여정이 더 큰 미래를 연다
If you go together, you go far



The Co-Creation Blueprint (Summary)



1. Indonesian Scale

Critical minerals (nickel, copper, bauxite), massive labor market, energetic young populace, and strategic market access across ASEAN.



2. Korean Innovation

Advanced semiconductor NPU design, battery cell chemistry, precision automation, global marketing, and institutional R&D scale.



3. Global South Exports

Jointly manufactured tech, green transit, smart city modules, and media IP exported competitively across Global South markets.

Moving from reciprocal trade to reciprocal creation is the defining mandate of Asian tech leadership.

Session 1

**A Multilingual Companion Active Hub for
Older Adults**

(Dr. Lee Yun Li, Sunway Univ., Malaysia)



RESEARCH SHARING · The 3rd International Symposium for Culture Technology (ISCT) 2026

A Multilingual Companion Active Hub for Older Adults

Extending Kiki Games Hub into a daily, multilingual companion for
physical and cognitive ageing-well across Asia

Lee Yun Li · Sunway University · 25 August 2026

kikichatbot.netlify.app

Overview

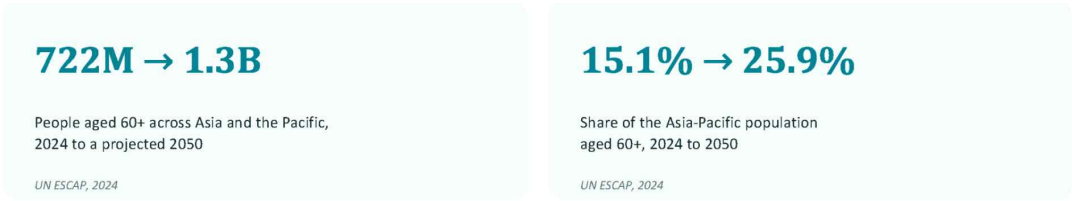
A quick walk from problem, to prototype, to collaborate

-  The Challenge – Ageing Well in Asia
-  From Kiki Games Hub to an Active Hub
-  The Vision, Product Design & Market Position
-  Research Design & Evidence Plan
-  Collaboration Ask
-  Discussion

MULTILINGUAL COMPANION ACTIVE HUB FOR OLDER ADULTS

2

The Challenge: Ageing Well in Asia



Longer lives are not automatically healthier ones

- Rising prevalence of loneliness and cognitive decline among older adults living alone or in smaller households
- Extreme linguistic and cultural diversity across the region makes one-size-fits-all digital interventions ineffective
- Community-based, low-cost tools for combined physical + cognitive engagement remain scarce and rarely track daily habits

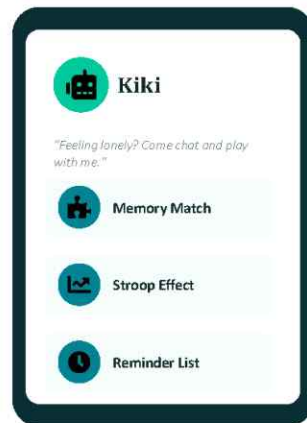
Why Both Body and Mind

Anchored in WHO's Healthy Ageing framework: sustaining functional ability & intrinsic capacity



Our Foundation: Kiki Games Hub

A live, working prototype — kikichatbot.netlify.app



What exists today

- Kiki – a friendly chatbot companion that greets, chats, and reduces the isolation of solo play
- Two browser-based brain-training games: Memory Match (visual pairs) and Stroop Effect (attention & processing speed)
- Audio narration and sound cues throughout, built with low digital literacy and low vision in mind
- A built-in reminder system that nudges players back to their next session

Validates the core idea: a warm AI companion can keep older adults returning to cognitive play

02 - FROM KIKI TO ACTIVE HUB

5

What's Still Missing

Kiki Games Hub proves engagement – the Active Hub extends it into a daily, whole-person habit

Kiki Games Hub today

- Cognitive games only – no physical activity
- Single language interface
- No daily activity tracking or dashboard
- Fixed game content, not personalised to the player

What the Active Hub adds

- Guided physical activity: resistance exercise, city walks, tai chi
- Multilingual delivery across Asian languages
- Individual activity tracing toward a daily 1-hour goal
- Reminiscence content and adaptive, AI-prompted routines

02 - FROM KIKI TO ACTIVE HUB

6



THE VISION

One companion. One hour a day of body and mind. Every language, every community.

A Multilingual Companion Active Hub turns Kiki from a games page into a daily age-well routine – guided physical activity plus cognitive training, in the player's own language, gently prompted by an AI companion and traced over time.

03 · THE VISION 7

Two Daily Pillars, One Hour Total

Every session blends guided movement with guided thinking

 **Physical · ~30 min**

-  Resistance exercise – seated & standing band routines
-  City walk challenges – outdoor or in-place, paced routes
-  Tai chi / Qi Gong – slow, low-impact flow sequences

Delivered as recorded guided-instructor video, self-paced

 **Cognitive · ~30 min**

-  Jigsaw puzzles – classic art & personal reminiscence images
-  New-language micro-lessons in the player's target language
-  Adaptive brain-training carried over from Kiki Games Hub

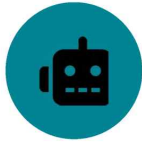
Difficulty adapts to the player's pace and history

03 · THE VISION

8

The AI Companion

Kiki grows up: from a games-page chatbot to a daily accountability partner



- Sends gentle, multilingual daily prompts toward the 1-hour physical + cognitive goal
- Greets and converses in the participant's preferred Asian language and script
- Adapts tone and pacing – encouraging, never nagging – based on recent adherence
- Surfaces reminiscence prompts ("tell me about this photo") to add a social, narrative layer

DAILY TARGET

60

minutes / day

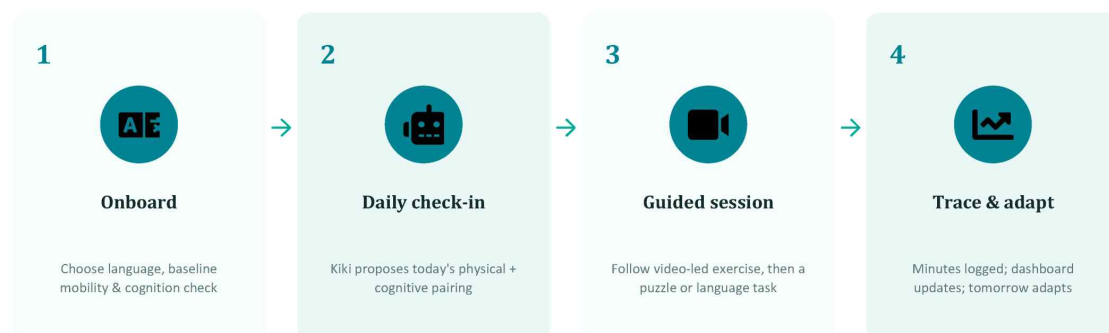
30 min physical + 30 min cognitive,
traced per session and logged to an
individual activity dashboard

03 · THE VISION

9

How It Works

A single daily loop, repeated and traced over months

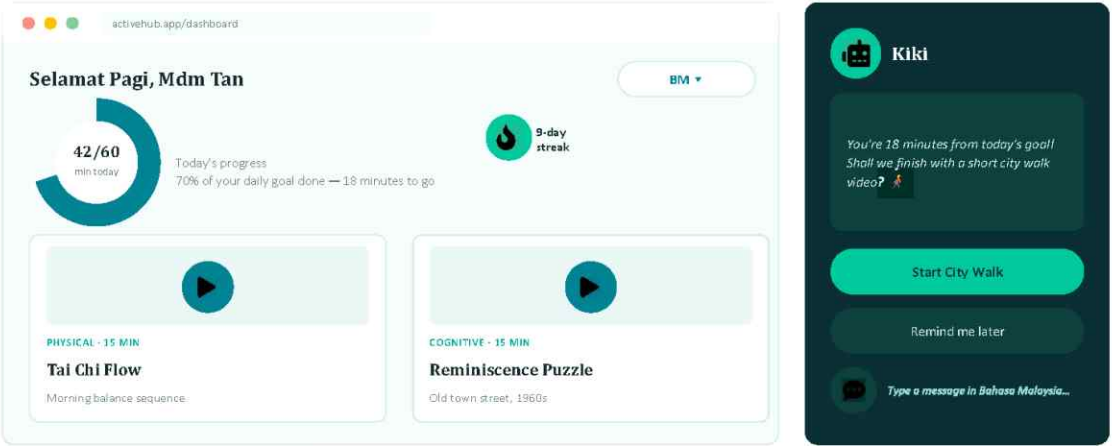


03 · THE VISION

10

Product Design: The Web-Based Active Hub

A single dashboard — today's goal, both activities, and Kiki, all in one browser tab



Wireframe concept — for illustration, not final visual design

03 · THE VISION

11

Positioning vs. the Market

AiMA (Beyond AI) proves the demand for AI elder companions — here's where we differ

	AiMA (commercial companion)	Active Hub (proposed)
Core focus	Conversation & loneliness companion	Structured daily physical + cognitive protocol
Language approach	13 languages spoken, general-purpose	Asian languages & dialects, culturally-grounded reminiscence content
Delivery & cost	Digital-human screen device / dedicated app	Browser-based, low-literacy friendly, low-cost to deploy
Monitoring	Wearable integration for physical/emotional signals	Activity tracing tied to an explicit 60-min daily goal
Evidence base	Public demos & user counts; no published trials	Designed for peer-reviewed feasibility & outcome studies

AiMA validates that AI companions engage older adults — our edge is a validated, Asia-specific, dosage-based intervention with a published evidence trail

03 · THE VISION

12

Research Design & Evidence Plan

A phased, mixed-methods approach to test feasibility before scale

	Population	Community-dwelling adults 55+ across 2 – 3 Asian language communities, recruited via community/eldercare centres
	Design	Co-design workshops → single-arm feasibility pilot → cluster-randomised trial across sites
	Outcome measures	Cognitive screening (e.g. MoCA), functional mobility, quality-of-life (WHOQOL-OLD), and system adherence/engagement analytics
	Duration	24-week intervention windows per phase, with 6-month follow-up for retention and habit durability

04 · RESEARCH DESIGN

13

Expected Contribution

What success looks like for the field and for participants

 For participants Sustained daily activity, reduced isolation, and a companion that speaks their language	 For the evidence base One of few feasibility datasets on combined physical + cognitive digital interventions in multilingual, low/middle-income Asian settings	 For policy & practice A field-tested, low-cost model aligned with regional active-ageing agendas (e.g. UN ESCAP's Madrid Plan of Action)
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04 · RESEARCH DESIGN

14

What to Collaborate?

This works best as a team – here's where we need partners



Gerontology / Clinical researchers

Study design, outcome validation, ethics oversight



Linguists & localisation partners

Multilingual content, script/dialect adaptation, cultural fit



Community & eldercare partners

Recruitment sites, pilot venues, on-the-ground trust



Health-tech / UX developers

Companion-bot logic, video delivery, tracking dashboard

05 - COLLABORATION ASK

15

Proposed Roadmap

From co-design to multi-site evidence



05 - COLLABORATION ASK

16



Let's work this together

A Multilingual Companion Active Hub – extending Kiki Games Hub into a daily, traceable, whole-person practice for ageing well across Asia.

Lee Yun Li · yunli@sunway.edu.my · kikichatbot.netlify.app

THANK YOU

17

Session 1

Culture Technology at Sunway University

(Dr. Sian Lun Lau, Sunway Univ., Malaysia)

3RD INTERNATIONAL SYMPOSIUM ON CULTURE TECHNOLOGY · ISCT 2026

Culture Technology at Sunway University

— and the Missing Layer in Southeast Asia

Opportunities, challenges and openings for collaboration —
from a technology and AI point of view

Prof. Ts. Dr.-Ing Sian Lun Lau
School of Computing and Artificial Intelligence
Faculty of Engineering and Technology
Sunway University, Malaysia



SUNWAY UNIVERSITY
Jeffrey Cheah Foundation
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Brief Self-Introduction



Education Background

- Dr.-Ing. and MSc in Electrical Communication Engineering, University of Kassel, Germany
- BEng with Hons in Electronic and Telecommunications Engineering, Universiti Malaysia Sarawak (UNIMAS), Malaysia

Research and Professional Experience

- Professor at the School of Computing and Artificial Intelligence, Faculty of Engineering and Technology, Sunway University, Malaysia
- Adjunct Professor, VIT Chennai Campus, India
- Vice Chair/Chair-elect, IEEE Computer Society Malaysia Chapter
- Previously
 - Researcher at ComTec, University of Kassel

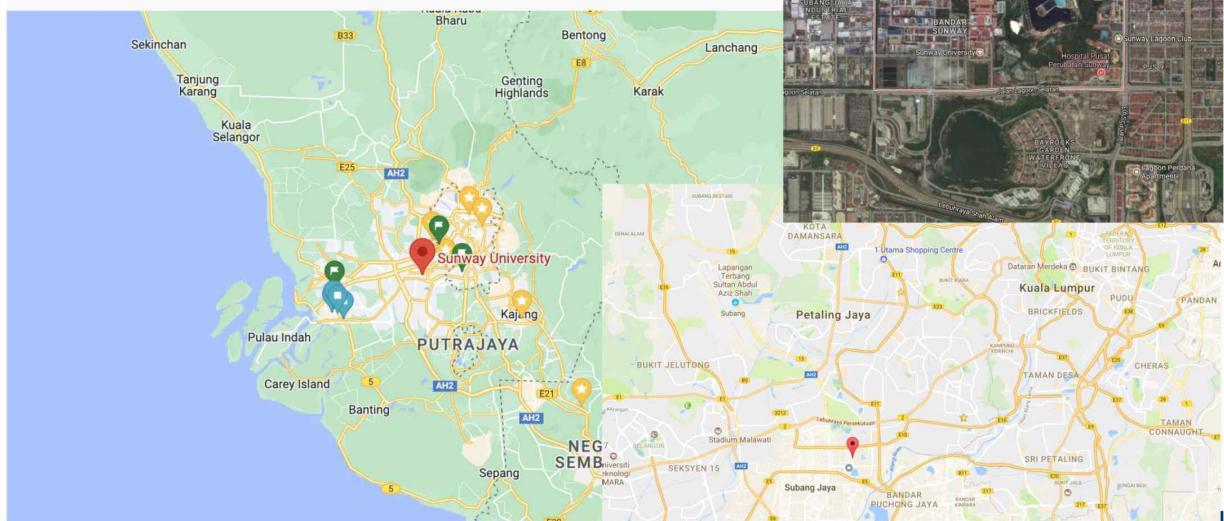


Where is Sunway City?

Bandar Sunway



What you may want to know about Bandar Sunway...





Sustainability is in the DNA of Sunway and Sunway University



SUNWAY UNIVERSITY, AS THE MISSION-DRIVEN 5TH GENERATION UNIVERSITY

Reimagining Education: Human-centred. AI-enabled. Planet-positive.

1
Positive Change



2
Quintuple-Helix Partnerships



3
Tech-Empowered Pro-Social AI



4
Life-long Education



5
Entrepreneurship & Employability






ACCOLADES & RECOGNITION



#354
IN THE WORLD
QS World University Rankings 2026



TOP 1000
IN THE WORLD
Shanghai Ranking 2024



#55
IN ASIA
QS Asia Rankings 2026



#338
IN THE WORLD
QS Sustainability Rankings 2026



EMPLOYER'S CHOICE OF UNIVERSITY
100% determined by leading graduate employers for four consecutive years—2022, 2023, 2024 and 2025.



AACSB ACCREDITED
First non government-linked private university in Malaysia to receive AACSB accreditation



#301-350
NO.1 RANKED PRIVATE, NON-GOVERNMENT-LINKED UNIVERSITY
THE World University Rankings 2026



#1 IN ASEAN
ASEAN Private University Ranking

#6 IN ASIA
All Asia Ranking



#141
IN ASIA
THE Asia University Rankings 2025



#45
IN THE WORLD
THE Impact Rankings 2025



TOP 5
IN MALAYSIA
U.S. News Best Global Universities



#1
PRIVATE UNIVERSITY RANKED IN MALAYSIA
UI Green Metric World University Rankings



MD
Premier Digital Tech Institution



COMPETITIVE (BERDAYASANG)
Emerging universities category 2022

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THE ARGUMENT IN ONE SENTENCE

Malaysia is not short of culture.

After AI Nation 2030, it is no longer short of technology.

It is short of the layer that connects them.

That unwired seam is where international collaboration has the highest return — and it is why I want to spend most of this talk on potentials and open problems, not on a capability list.

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WHERE WE STAND · 1 OF 2



The culture half is not what's missing

Sunway Centre for Digital Humanities and Cultural Heritage (SCDHCH) — Ethnographically grounded, community-embedded documentation.

2017 First room-scale VR heritage experiences

~20 Projects across documentation, VR, AR

4 Units: Archives, A/V, Engagement, Projects

Merdeka Textile Museum

Digital galleries at Merdeka 118 - RM200,000 external grant

Hainan Boatbuilder, Pangkor

Vanishing craft captured - published with Google Arts & Culture

Folklore Stories

Immersive reimagining of orally transmitted narratives

The Hidden Waterfall City

Immersive visualisation over ultra-high-resolution heritage datasets

PureLand · Mogao Grottoes

iPad AR of Cave 220, with the Dunhuang Academy

VARRN

ASEAN-wide VR/AR research network — already built, worth reviving

Partners: Google Arts & Culture · EPFL eM+ · City University of Hong Kong · Dunhuang Academy · Goethe-Institut · Pro Helvetia

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SCDHCH activities



▲ **Public engagement** — Dr Patricia Hardwick at Forum Penghasilan Dokumentasi Tarian Mak Yong at Malaysian National Archive in conjunction with the celebration of Audiovisual Day 2025.

📍 **Mak Yong Recording** — Our team recorded the vocal for the Mak Yong installation sound pod with Zamzuriyah Zahari.



▲ **Marhaban Recording** — Our team recorded marhaban, tahlil and talbiah which will be a part of the MTM soundscapes in various parts of the installations.

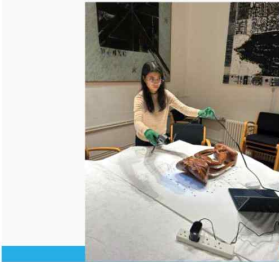


◀ **Demonstration of VR showcase** — shown during a visit from the Brunei's Ministry of Education.

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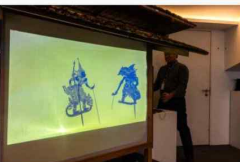
Collaboration under University of Cambridge's Natural History Humanities (N2H) Initiative





SCDHCH's contribution to Wayang Kulit heritage





Merdeka Textile Museum Field Work – Batik production in Kelantan



MTM Field Work: The team's efforts have been focused on capturing the rich heritage of Malaysian textiles, including:

◀ **360 Shoot of Batik Production in Kelantan:** Delas and Lisa spearheaded an immersive 360-degree photoshoot in Kelantan, meticulously documenting the intricate processes and vibrant artistry of local batik craftsmanship.

◀ **Tekad and Telepak Shoot:** David and Dr Patricia conducted specialized filming and photography sessions in Kuala Kangsar and Kuala Terengganu, focusing on the prestigious traditional arts of Tekad (gold embroidery) and Telepak.

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▲ **Wayang Kulit Expert:** An insightful interview with Cikgu Dain, one of the most senior tok dalang, on the wayang kulit puppets from the Prof Ghulam Archive. His expertise is invaluable for identifying the lineage, character and origins of these historical pieces. The information is crucial towards production of a catalogue of these puppets that will be out soon.



▲ **Poetry Recording:** We had the opportunity to record the voices of multiple Sasterawan Negara – Dato' Anwar Ridhwan, Prof Muhammad Hj Salleh, Dato' Zurinah Hassan and Dr. Siti Zainon Ismail for the MTM poetry content.



▲ **MTM Textile Discussion:** A great discussion with Mr. Khairul Anwar on textiles and the narratives for the MTM Project. He is an expert advisor, textile collector and culture writer, we are happy to be able to consult with him.



◀ **Behind the scenes:** To enrich the visitor experience at the Merdeka Textile Museum, our team recorded traditional music. This project involved collaborating with talented musicians from Kelantan to create ambient soundscapes and dedicated musical content, including Menghadap Rebab, Asyik and Ulek Mayang for specific exhibits.



▲ **Showcase:** Dr. Mah Sue Lynn from the Department of Psychology collaborated with the SCDHCH to capture immersive 360-degree footage of Sunway University, enhancing our marketing efforts to attract future students.



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TEAM MEMBERS



SUNWAY UNIVERSITY

Sunway Centre for
**DIGITAL HUMANITIES
AND CULTURAL HERITAGE**






AP Dr Patricia Ann Hardwick
Head of Department



Mohamad Hilman Nordin
Senior Research Fellow



Jocelyn Ng Siu Lyn
Research Fellow



Prof Mayco A. Santaella
Archives Unit



Assoc. Prof. Tom Pierard
Audio Visual Unit



Dr. Fiona Wong E Chiong
Public Engagement Unit



Delas Santano
Affiliate Member



Maslisa Zainuddin
Affiliate Member



Shafiq Izzudin
Research Assistant



Arreyallycea Jasli
Research Assistant

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WHERE WE STAND · 2 OF 2

Two halves that have not met




CULTURE SIDE

SCDHCH

- Capture, curation and immersive presentation
- AR / VR / documentation-led
- Deep community relationships and field method
- Very little machine learning anywhere in it

?

no bridge

TECHNOLOGY SIDE

SCAI + HUMAC

- School of Computing and AI — established 2025
- Human-Machine Collaboration Research Centre: haptics, robotics
- Game art, digital media, film, audio technology at scale
- No cultural remit yet

This is not a Sunway pathology — it is the regional pattern. Culture institutions and AI institutions sit in different ministries, different funding streams and different publication cultures. I am putting it on a slide because a stated gap is a collaboration slot; a polished capability list invites nothing.

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THE POLICY WEATHER · MALAYSIA

SUNWAY UNIVERSITY Jeffrey Cheah Foundation
Raising the Level of Malaysia

A serious AI agenda with a culture-shaped hole

- 1 AI Malaysia Berhad**
Evolved from the National AI Office (est. Dec 2024). Now leads national strategy, implementation, governance and an AI safety function.
- 2 AI Nation 2030 — National AI Action Plan 2026–2030**
Structured as Impact Engines plus Foundational Enablers, with national targets on GDP contribution, jobs and global index position.
- 3 Sovereign AI Ecosystem**
Trusted local datasets, indigenous models, domestic compute. "Made by Malaysia AI" reflecting Malaysia's languages, contexts and values — with Dewan Bahasa dan Pustaka named as a data provider.

THE HOLE

Language and national identity are in.

Arts, heritage, performance and material culture are not a named impact area.

That absence is the clearest entry point in the whole plan.

Also in force: AIGE national AI governance and ethics guidelines (voluntary, principles-based) · PDPA amendments phased in from 2025 — DPO requirement, breach notification, cross-border transfer guidance. Both bear directly on any oral-history or community-recording dataset.

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THE POLICY WEATHER · ASEAN

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Raising the Level of Malaysia

The region is moving — unevenly

REGIONAL FRAMEWORKS

- ASEAN Digital Masterplan 2030**
Adopted Jan 2026 with the Hanoi Digital Declaration
- ASEAN Guide on AI Governance & Ethics**
2024, expanded for generative AI in 2025 — voluntary, but the shared vocabulary
- ACHDA — Cultural Heritage Digital Archive**
JAF-funded, now Phase 2. The most relevant regional mechanism, and under-used by universities

NATIONAL MOVES

- Singapore**
SEA-LION SEA-language models, SEALD data programme, AI Verify assurance
- Vietnam**
"Digital heritage" written into the revised Law on Cultural Heritage — the region's first statutory recognition
- Malaysia · Indonesia · Thailand**
MaLLaM Bahasa Malaysia LLM — national heritage digitisation drives creative-economy consolidation

The read: Southeast Asia now has language models, digital archives and policy vocabulary. What it lacks is the layer connecting them to living, performed, material culture.

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POTENTIALS



What we can put on the table

- | | |
|--|---|
| <p>1 An existing heritage corpus</p> <p>2 Young faculty/school/centres looking for domains</p> <p>3 Students who can actually build</p> <p>4 Physical testbeds</p> <p>5 A genuinely and unique hard test case</p> | <p>A decade of community-embedded documentation, ultra-high-resolution datasets and immersive builds — already collected, already consented</p> <p>Faculty, SCDHCH, HUMAC, School Computing and AI established in recent years — actively seeking application areas</p> <p>Game art, digital media, digital film, audio technology and creative-arts postgraduates, at scale</p> <p>AR/VR and capture facilities, exhibition and projection infrastructure, museum engagements and a new major performance venue</p> <p>Multilingual, multi-script, multi-faith cultural context — including Jawi and endangered oral traditions. Difficult, and therefore useful</p> |
|--|---|

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CHALLENGES - 1 AND 2



Data has no schema. Rights have no floor.

1 Intangible heritage has no data standard

- Text and images are solved problems. Gesture, gait, gamelan tuning, weave structure, ritual sequence and dialect prosody are not.
- There is no shared way to annotate a performance so that another institution's model can consume it.
- Low-resource scripts compound it — Jawi OCR and transliteration remain open research with only small community datasets.
- Our own back catalogue proves the point: every project had to invent its own capture method.

Open question: who convenes the schema conversation, and under whose governance?

2 The rights floor is missing

- WIPO's 2024 treaty covers genetic resources and associated traditional knowledge — but traditional cultural expressions remain unresolved.
- So there is no international standard for whether, or on what terms, a generative model may train on a community's cultural expressions.
- Layer PDPA and community consent on top and any serious corpus needs its rights architecture designed before the first recording.
- This is a first-class research problem, not a legal footnote.

Open question: what does meaningful benefit-sharing look like when the "use" is model training?

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CHALLENGES · 3 AND 4



We can generate culture faster than we can judge it

3 We cannot measure cultural correctness

Today, an AI model can generate a batik motif, a pantun, a wayang figure or a gamelan phrase in seconds.

Nobody can score whether it is culturally valid.

- No benchmark. No rubric. No held-out test set. No inter-rater protocol.
- Compare: AI safety and assurance now have testing regimes taking shape internationally. Cultural fidelity has nothing equivalent.
- And it cannot be built by one culture — a single-country benchmark is a contradiction in terms.

The single highest-value open problem in the field — and the most obviously multilateral.

4 The incentives punish this work

- Research-creation outputs — an exhibition, an immersive experience, a community archive — sit poorly in publication-count promotion systems.
- Culture-side and AI-side researchers publish in venues that do not read each other.
- Talent trained on both sides is scarce and mobile.
- Net effect: the people best placed to do this work are structurally discouraged from doing it.

Open question: does your institution reward it?

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FOR DISCUSSION



Questions I would rather leave open

- 1 Does your institution have any way to evaluate whether a generative output is culturally correct — or do you also rely on an expert eyeballing it?
- 2 Who owns culture-technology work where you are: the arts faculty, the computing faculty, or neither?
- 3 Does your funding landscape look like ours — culture money, research money and AI money in three different buildings?
- 4 What would meaningful benefit-sharing look like when the “use” of a cultural expression is training data?

Culture technology in Malaysia is not short of culture, and it is no longer short of technology. It is short of the connective layer — shared schemas, shared benchmarks, shared rights architecture. None of those can be built by one university, and none by one country.

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Session 2

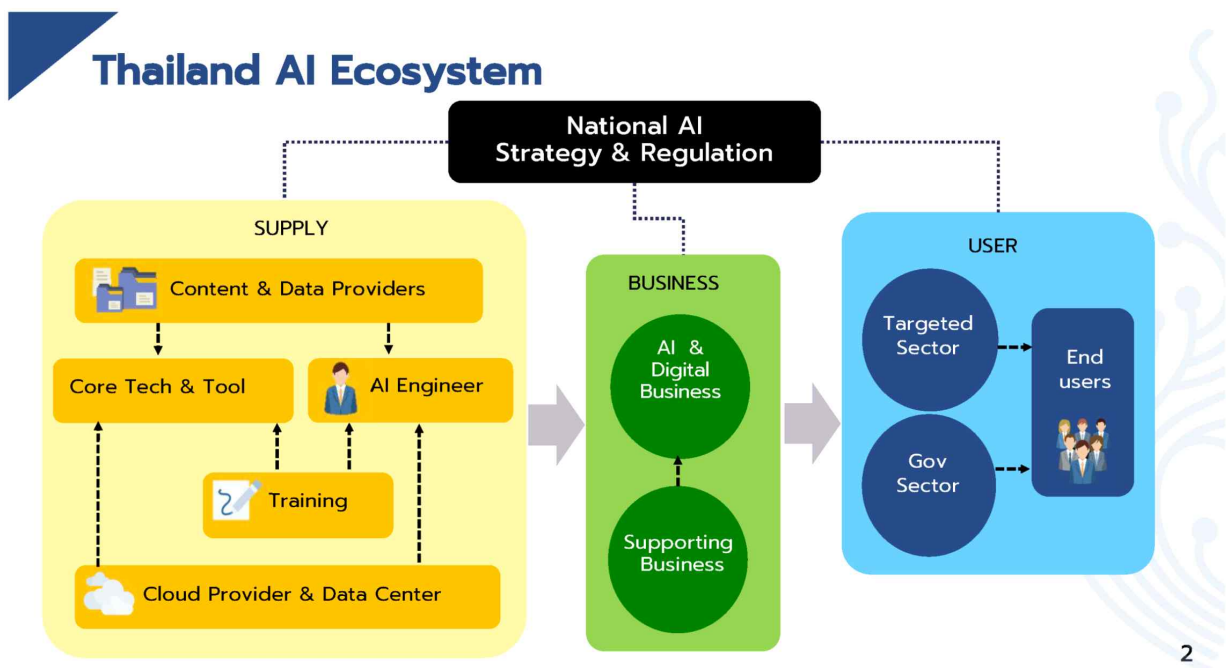
AI-based Research Trends in Thailand & Future Prospects

(Dr. Thepchai Supnithi, NECTEC, Thailand)

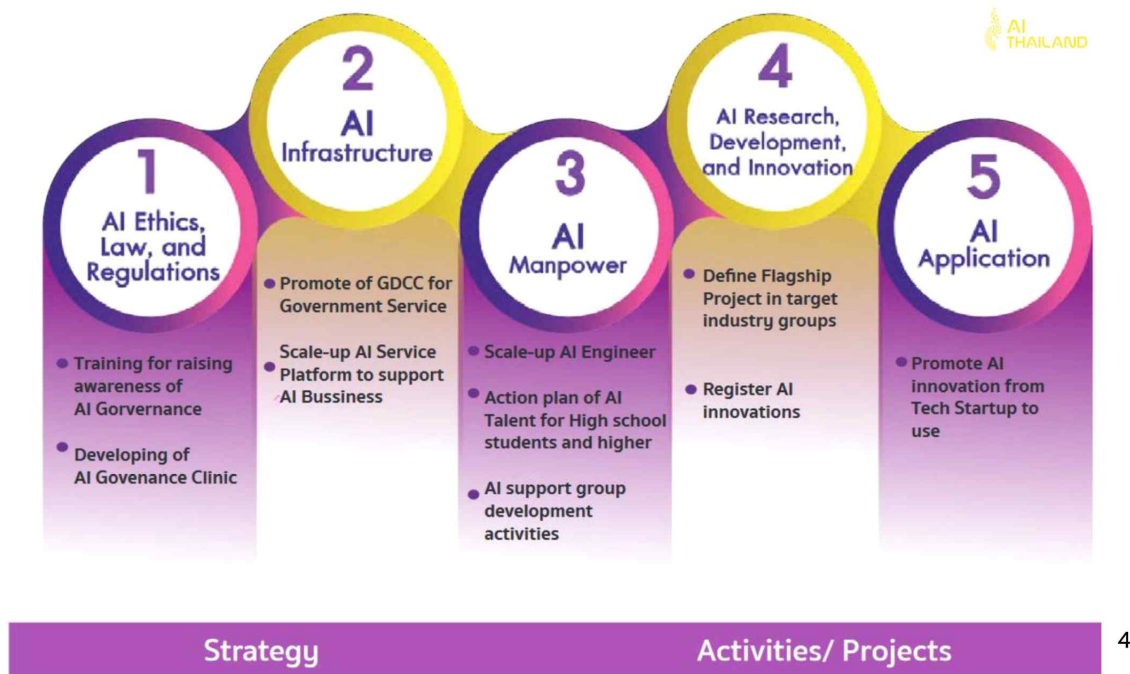
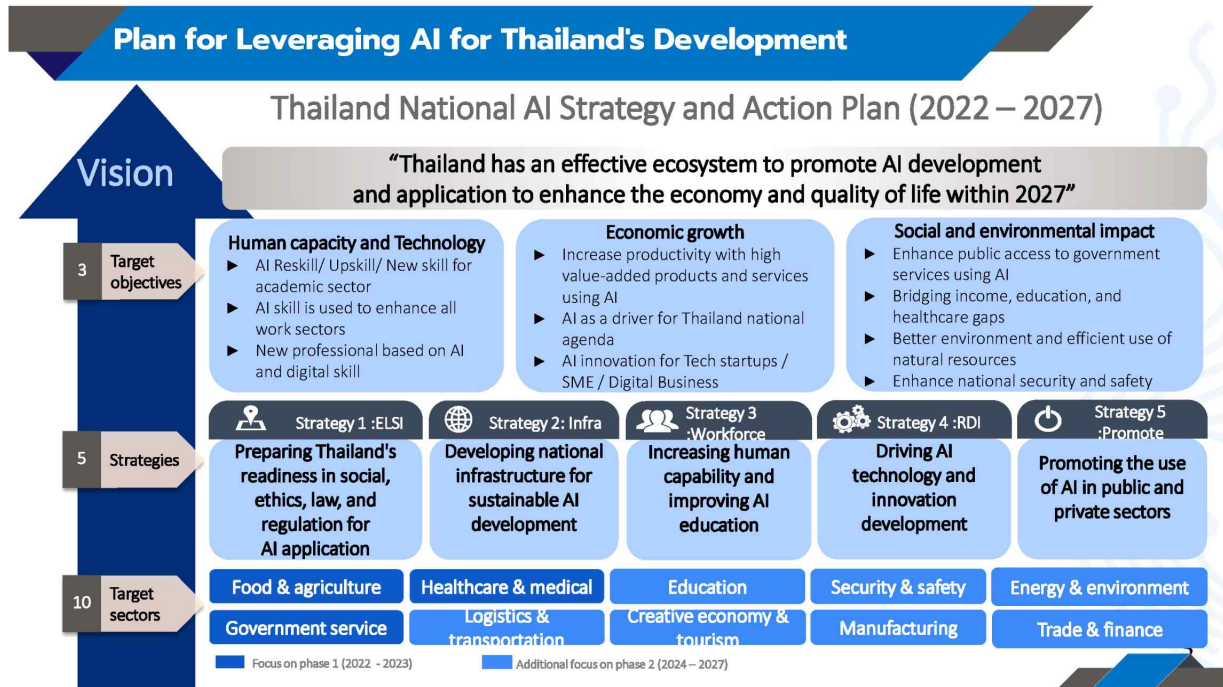
AI-based Research Trends in Thailand & Future Prospects

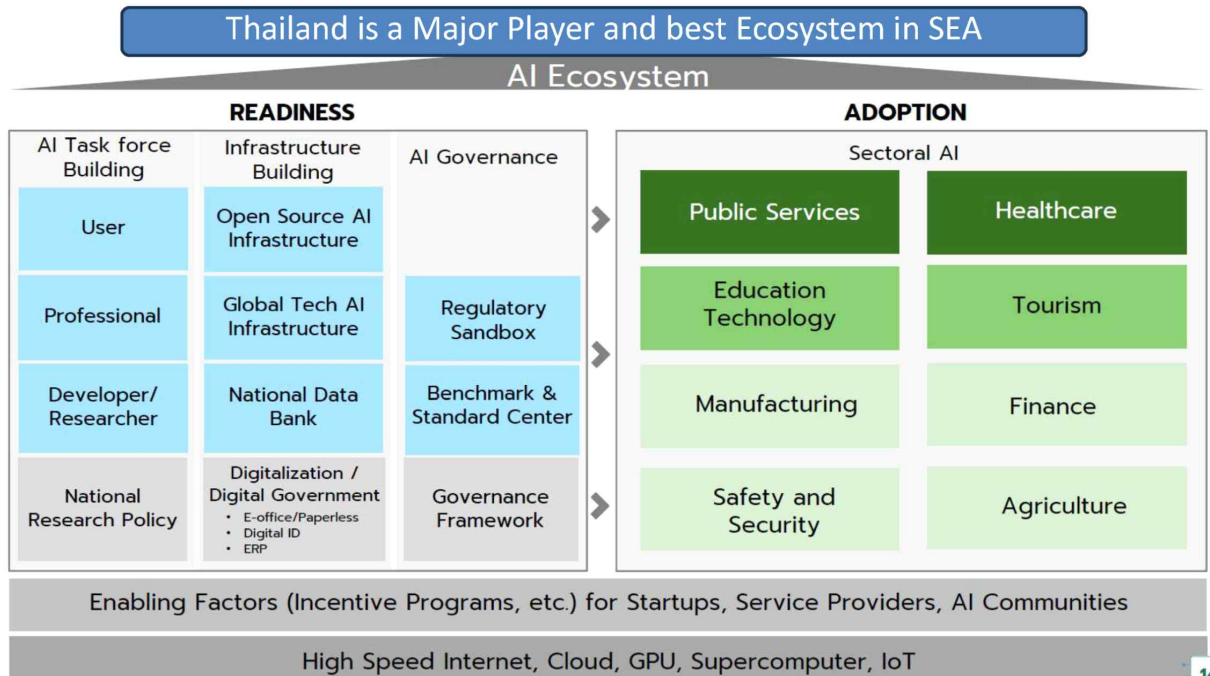


Thepchai Supnithi
Artificial Intelligence Association of Thailand
National Electronics and Computer Technology Center

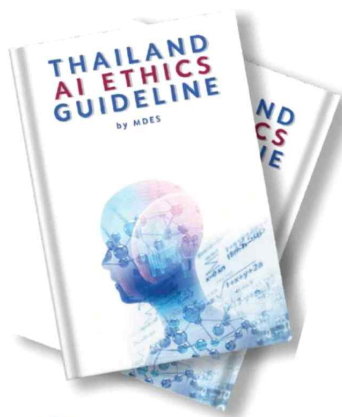


2





AI Ethics and Awareness



- By 2021, the Cabinet approved the AI Ethics guideline and called for raising awareness among various organizations in the country
- Office of the National Digital Economy and Society Commission has organized the AI Ethics training with more than 5,300 participants



AI Ethics

- 1  ความสามารถในการแข่งขันและการพัฒนาอย่างยั่งยืน (Competitiveness and Sustainability Development)
- 2  ความสอดคล้องกับกฎหมายจริยธรรมและมาตรฐานสากล (Laws Ethics and International Standards)
- 3  ความโปร่งใสและการรับผิดชอบต่อสังคม (Transparency and Accountability)



Target Users

- End User
- Developer
- Executives



- 4  ความมั่นคงปลอดภัยและความเป็นส่วนตัว (Security and Privacy)
- 5  ความเท่าเทียม หลากหลาย ครอบคลุม และเป็นธรรม (Fairness)
- 6  ความน่าเชื่อถือ (Reliability)

AIGC





AI Governance Clinic (AIGC) by Electronic Transactions Development Agency (ETDA) launched in Nov 8, 2022 will serve as a central hub for

- Developing AI Governance frameworks
- Providing consultancy in AI implementation
- Cultivating and disseminating knowledge and research outcomes
- Building a network of experts both locally and internationally.

AI Standard Landscape in Thailand

Collaborations among government agencies

Guidelines



Thailand AI Ethics Guideline

<https://www.eta.or.th/getattachment/9d370f25-f37a-4b7c-b661-48d2d730651d/Digital-Thailand-AI-Ethics-Principle-and-Guideline.pdf.aspx?lang=th-TH>

NSTDA AI Ethics Guideline

<https://waa.inter.nstda.or.th/stks/pub/2022/20220331-ori-ai-research-integrity-guideline.pdf>

Thailand AI Guidelines 1.0 TAIG 1.0

<https://www.law.chula.ac.th/event/20152/>

Laws



(Draft bill) Business using AI (Public Hearing) (2022)

(Draft bill) Promotion and Support AI Innovation (Apr 2023)

Standards



- Study AI Standard Landscape of Thailand
- Study how to establish AI Testing Center in Thailand
- Study how to govern AI in organization
- construct the Face Verification System testing

Key Achievements

AI Work force



AI Workforce Development

Tech



Government service

Tech



Thai LLM

Std.



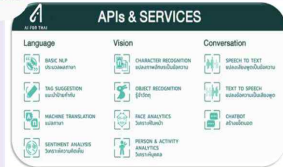
Med AI Standard Testing

Tech



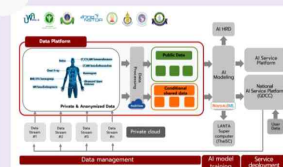
Biometrics

Tech



AI Service Platform

Tech



Med AI Data Sharing Platform

Infra.



LANTA Usage

10

Infrastructure

National AI Platform
By NSTDA and ONDE
<https://nationalai.in.th/>

AI Service on Government Cloud Platform(GDCC)

GDCC: CPU 240 Core, Mem 296 GB, HDD 1,550 GB

- API Service > 80 services
- API called more than 1,000,000 calls/month

<https://https://www.eta.or.th/th/Our-Service/AIGC/index.aspxai.in.th/>


Supercomputer Center

LANTA: HPC for R&D (Government and Private Company supported)

Rank #1 in ASEAN and World rank 116

2022 installation completed

2023 10 pioneering projects e.g.

Thai LLM

Genomic Thailand

PM2.5 prediction

2024 Pay-per-use service open (at 15-60% market price)

<https://thaisc.io/>

11

Government Cloud



Supercomputer Center

2022 installation completed

Specifications

- 346 nodes Heterogeneous HPE Cray EX cluster
 - ▶ 176 GPU nodes with 704 NVIDIA A100 GPUs
 - ▶ 160 CPU nodes with 20,480 CPU-cores
 - ▶ 10 High-memory nodes, each contains 4TB of memory
- 10 PB of high-performance parallel storage
- High-performance interconnect using 200 Gbps

Global ranking

HPC TOP500 Ranking (NOV. 2024)	Rank #91 (Singapore)	Rank #92 Thailand	Rank #142 Thailand
	 USCC National Supercomputing Center	 PTTEP	 ThaiSC
System	ASPIRE 2A+	THE CRUST 2.5	LANTA
Manufactured by	NVIDIA	HPE Cray	HPE Cray
Total Pflops	14.20	13.85	8.15

ตัวอย่าง : pioneering projects

- PM2.5 prediction
- SAR-CoV-2
- Thai LLM, Medical LLM

12

Key Achievements (2024) Infrastructure

LANTA

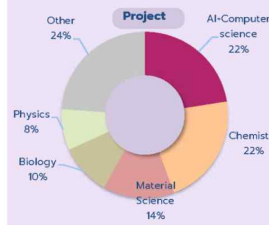


CPU Utilization 75%



GPU Utilization 60%

Utilization



- 207 Projects
- 1,600 Active users

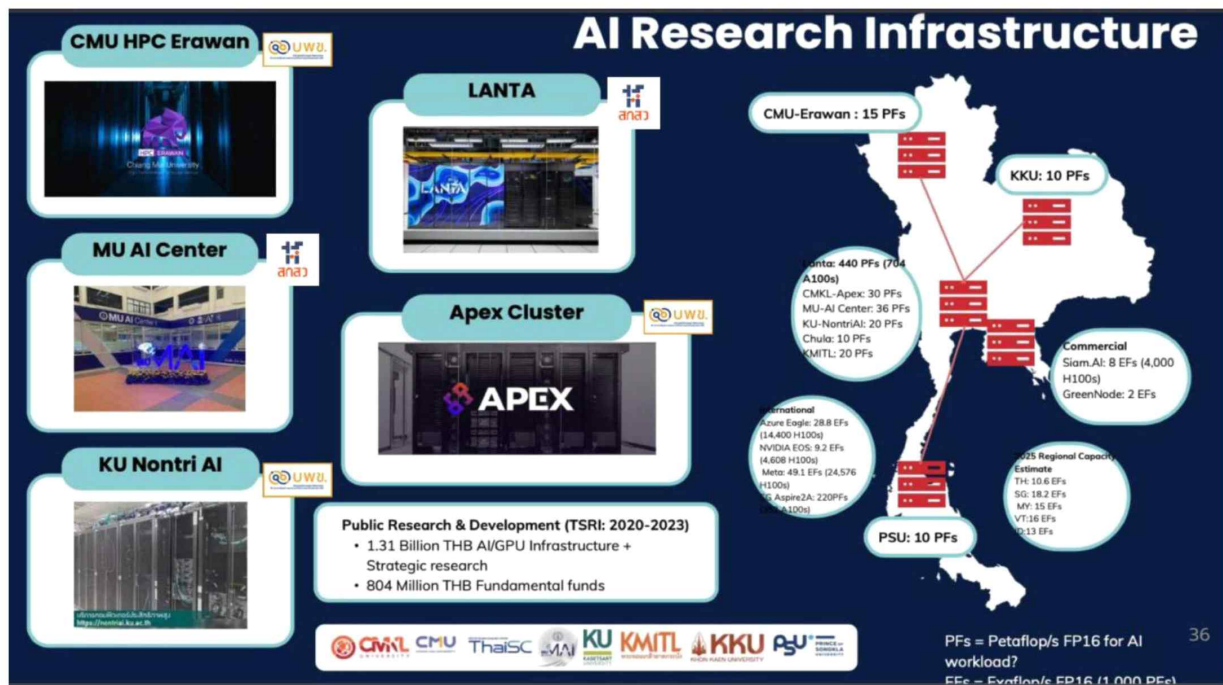
22%
AI & Computer Science Project

LANTA Domain	project
AI+Computer Science	79
Chemistry	77
Material Science	49
Biology	35
Physics	28
Other	84
Total	352



Usage Statistics

13



AI for Thai

Thai AI Service Platform aiforthai.in.th

- AI API
- Pre-trained model
- Data set



2019	2022	2024	2025 March	next
AI-a-a-S platform open	GDCC support	65 services available 49M transactions 13,000 accounts	78 services available 84M transactions 20,716 accounts	Transfer to National AI Service Platform under MDES



LANGUAGE

บริการประมวลผลภาษาธรรมชาติ เช่น Word Segmentation, POS Tagging, Named Entity Recognition



VISION

บริการประมวลผลภาพ เช่น OCR, Face Recognition, Person Heatmap



CONVERSATION

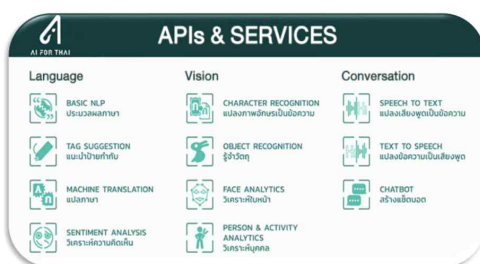
บริการประมวลผลบทสนทนา เช่น Text, Chatbot, Text-to-Speech

15

Key Achievements (2024) Core Technology Development

AI Service Platform

A platform for local AI services available publicly at **aiforthai.in.th**



Highlight Services

- Problem Extraction
- Sentiment Analysis
- Text to Speech
- Thai Tokenization

	2023	2024	Total
New services available	20	12	84
Transactions (million)	19.43	62.10	123.22
Thai LLM Downloads	10,968	150,042	161,010
Active User Accounts	8,282	4,131	23,099

16

Key Achievements (2024)

Thai LLM



Pathumma LLM : Fine-tuning 27B parameters

Thai LLM Foundation (2568)

Thai LLM

Opensource Model



Pathumma LLM-based Chatbots (2567-2568)

5 Organizations

>20 Ongoing Organization



Revolution of Thai LLM

2005 – The Cloud

2010 – IBM Watson

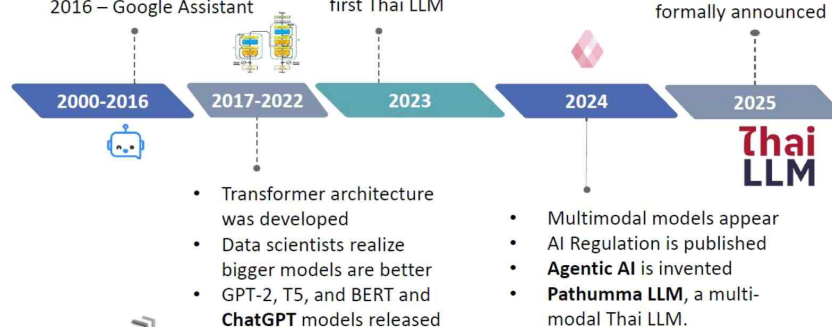
2011 – Siri

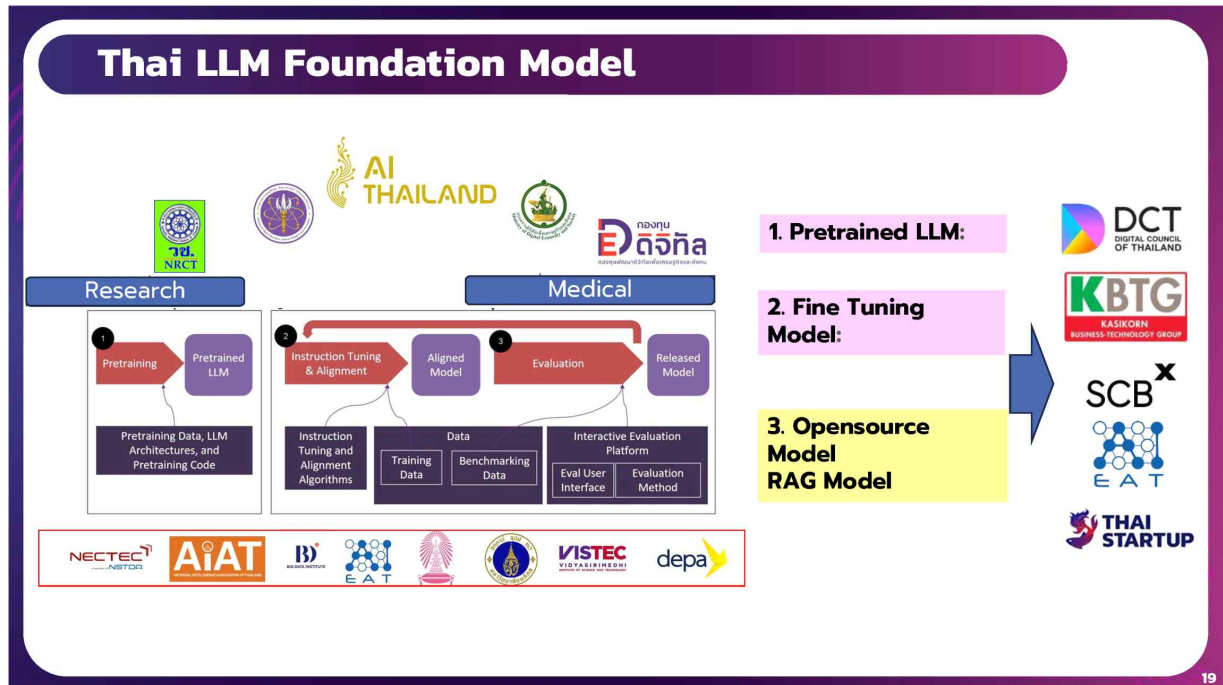
2014 – Cortana & Alexa

2016 – Google Assistant

- **RAG** (Retrieval Augmented Generation) is invented
- **OpenThaiLLM** launched first Thai LLM

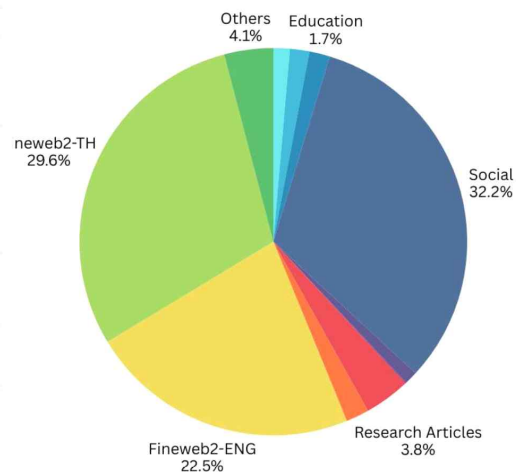
- Reasoning and Voice models
- **Agentic AI** is the main key trend, with lots of innovation
- **ThaiLLM** development is formally announced

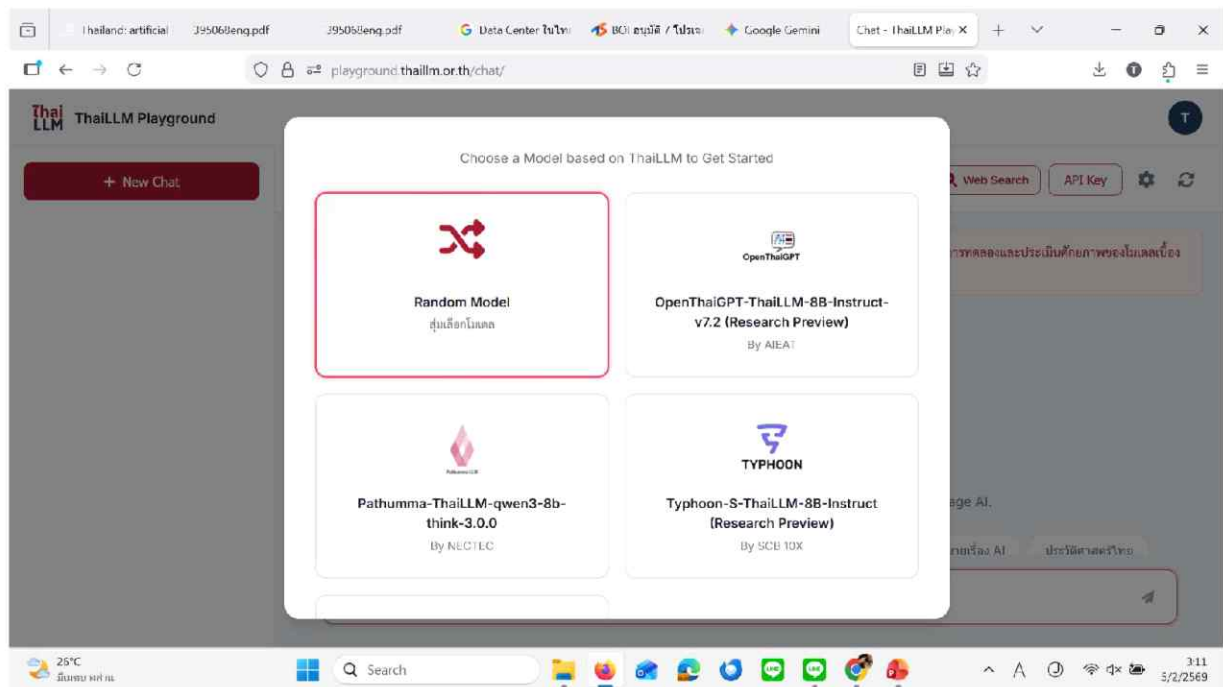
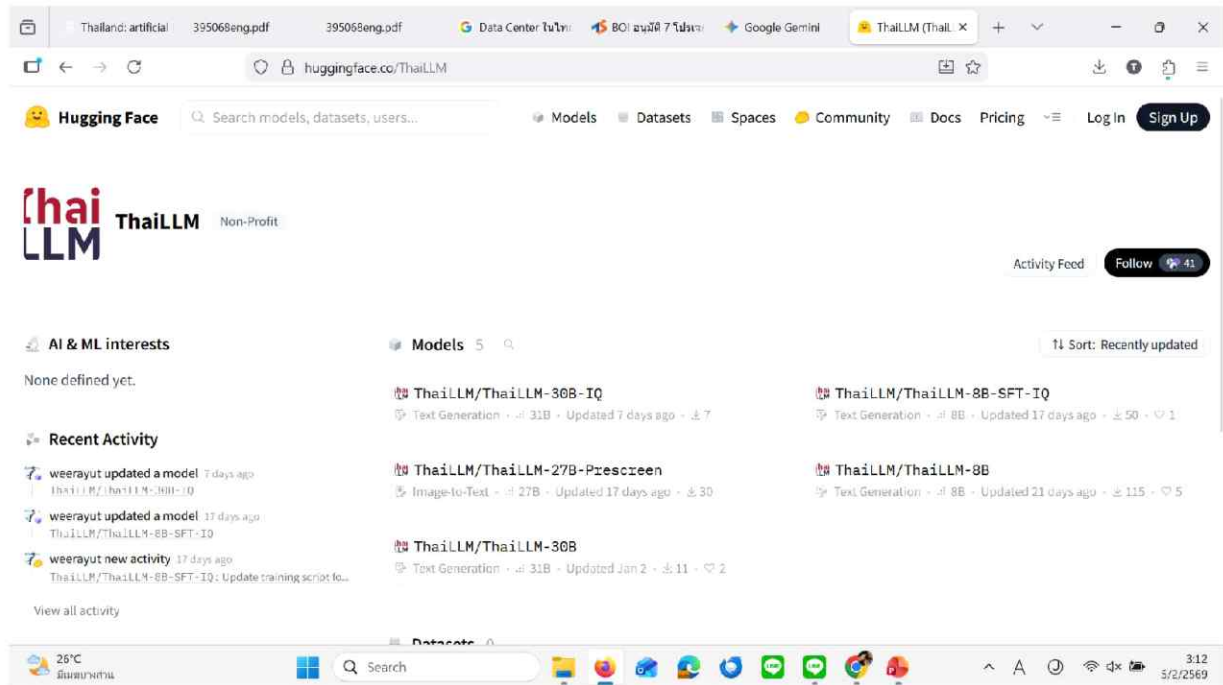




Thai Data Bank

Category	Token Count
1. Business & Finance	1,457,848,147
2. News	1,727,788,473
3. Education	1,818,734,655
4. Social	34,308,551,497
5. Government	1,161,467,951
6. Medical	39,944,404
7. Conversation	61,598,316
8. Code	563,661
9. Research Articles	4,051,000,000
10. Law	2,058,214,980
11. Travel	3,678,555
12. Fineweb2-ENG	24,000,000,000
13. Fineweb2-TH	31,525,674,209
14. Others	4,348,828,151
Average	106,563,892,999









NECTEC's Pathumma LLM

Smart communication with multimodal support: image, speech, and text



Text

Advanced natural language processing for Thai language texts



Vision

Capability in image and object recognition and understanding



Audio

High-accuracy Thai speech recognition and natural language response system

Key Features

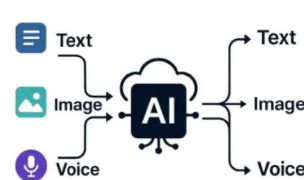
Text: Understanding Thai language context

Speech: Speech-to-text, emotion analysis, and gender detection

Image: Detailed image description

Multimodal: Supports queries via speech, image, and text

Deep Context: Capable of understanding complex questions



5







DocChat

RAG application

วาระสารบบการออกกฎหมาย

ฉบับที่ 6 ฉบับที่ 1 บรรณาน - กฎหมาย 2567

การจัดการออกกฎหมายฉบับที่ 6 ฉบับที่ 1 บรรณาน - กฎหมาย 2567

วันที่ออก: 08/12/2566, วันที่บังคับใช้: 27/03/2567, วันที่แก้ไข: 29/03/2567

บทบัญญัติ

การออกกฎหมายฉบับที่ 6 ฉบับที่ 1 บรรณาน - กฎหมาย 2567 มีผลใช้บังคับตั้งแต่วันที่ 27 มีนาคม 2567 เป็นต้นไป

รายการเอกสาร

- วันที่ออก: 21 กรกฎาคม 2558
- วันที่ออก: 26 มิถุนายน 2558
- วันที่ออก: 18 กรกฎาคม 2558
- วันที่ออก: 15 มกราคม 2558
- วันที่ออก: 19 กุมภาพันธ์ 2558
- วันที่ออก: 22 ธันวาคม 2557
- วันที่ออก: 2 มิถุนายน 2558

Parliament x รัฐบาล GI

เอกสาร: วันที่ 18 กรกฎาคม 2558

1 of 101

เอกสารฉบับที่ 6 ฉบับที่ 1 บรรณาน - กฎหมาย 2567

เอกสารฉบับที่ 6 ฉบับที่ 1 บรรณาน - กฎหมาย 2567

เอกสารฉบับที่ 6 ฉบับที่ 1 บรรณาน - กฎหมาย 2567

Chatbot

Active citizen Results

Popular sovereignty Results

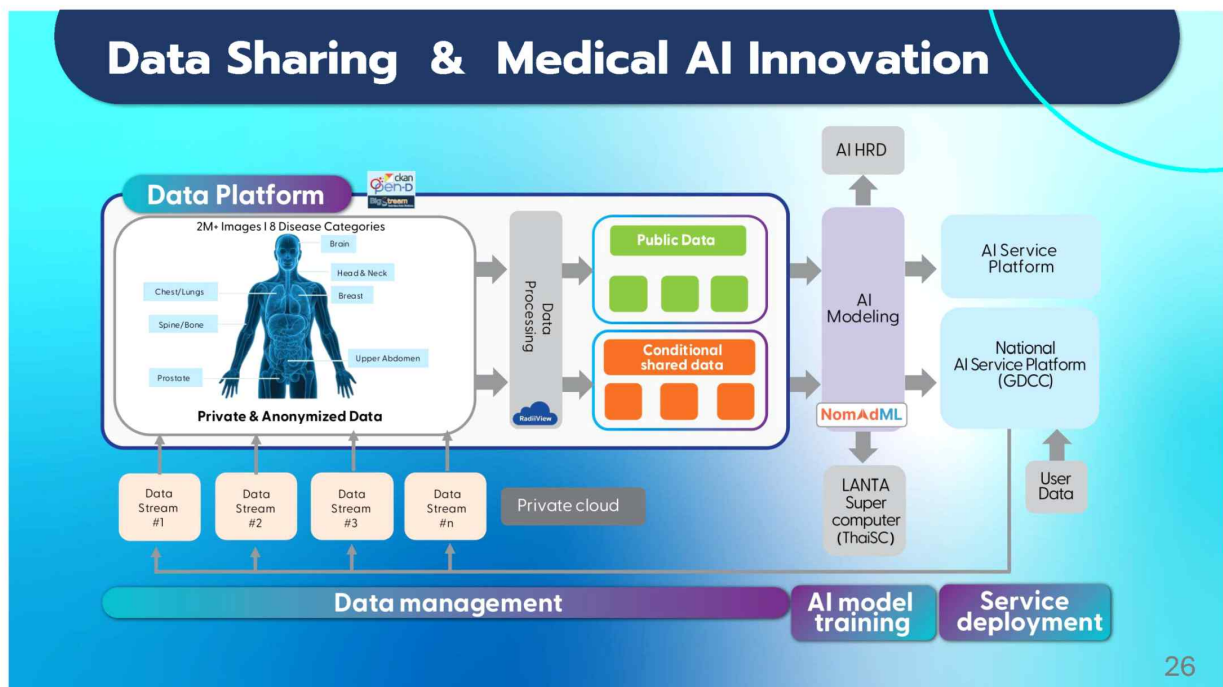
Popular sovereignty Results

○ Parliament: Retrieval, Summarize, QA

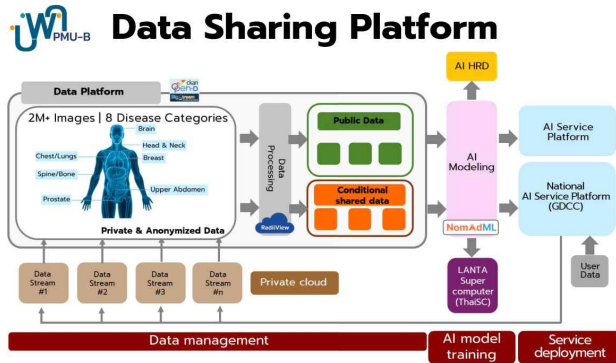
○ NRCT: Retrieval



34



Key Achievements (2024) Core Technology Development



Medical AI

Medical AI Consortium

8 Organizations Member
4 Ongoing Process

2.9 M+ Images

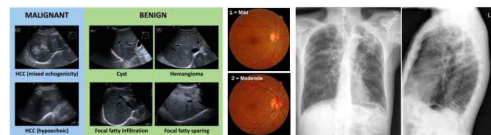
7 Diseases

1 AI Service

LiVerSound



4 AI Models



27

Key Achievements (2024) Core Technology Development

Thai Red Cross Biometric Authentication System (TRCBAS)

- Face และ Iris Scan
- Healthcare Service for Immigrants



Services in 16
Provinces

Accuracy 99.75%

Register Member	2023	2024	Total
Immigrants	35,300	320,000	355,300
Hospital	50	222	272

Biometrics

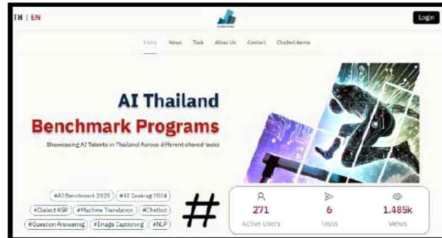


MOU among NSTA, Ministry of Public Health and Thai Redcross Society

28

AI Benchmark Program

benchmark.ai.in.th



2026 tentative

- Thai sign language
- Online meeting summarization
- Hand-writing recognition

2027 tentative

- Trustworthy LLM assessment
- EEG signal interpretation

2024 – 2025

English–Thai Translation

Evaluate the ability of AI models in translating English into Thai

Transcription of Local Dialects

Evaluate the ability of AI models in transcribing Thai regional dialects

Image Captioning

Evaluate the ability of AI models in generating the captions of images

Medical Conversation Translation

Evaluate the ability of AI models in translating medical conversations from Chinese into Thai

Question Answering from Documents

Evaluate the ability of AI models in answering questions from Thai documents

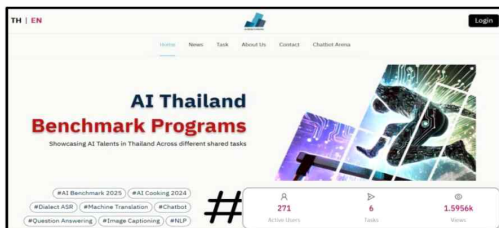
Online Meeting Transcription

Evaluate the ability of AI models in transcribing online meetings

10

Key Achievements (2024) AI Benchmarking

 <https://benchmark.ai.in.th>



AI Benchmarking

- Developing Benchmark Dataset

28 AI Corpus Launched

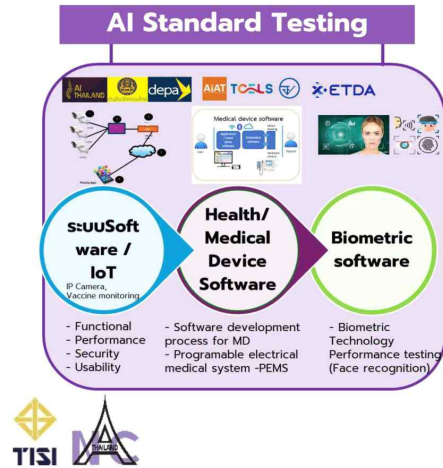
30

Key Achievements (2024)

Standard Testing



AI Standard Test Software Quality Testing Lab (SQUAT)



2025 AI Standard Testing

AISaMD (AI-driven Software as a Medical Device)

- ISO/IEC TR 29119-11:2020 **NEW**
- 8 service requests

AI Service (AI Software in IoT)

- ISO29119-11, ISO/IEC DIS25059
- 2 service requests

AI Biometrics

- มารถฐาน มตพ. 30
- 2 service requests

31

Key Achievements (2024)

Government Service



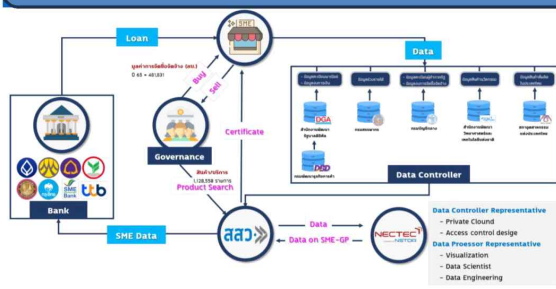
บริการสนับสนุน SME
เพื่อเพิ่มขีดความสามารถ



Thai People Map and Analytics Platform



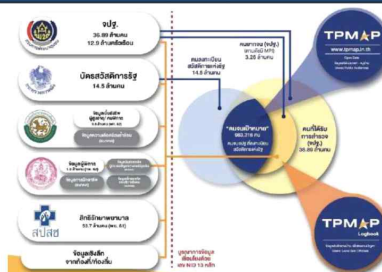
SME Government Procurement



Registered in THAI SME-GP **96,308**

- SME 50,200
- Government 46,108

Data integration



TPMAP Logbook **400,318 คน**

32

Key Achievements (2024)

AI Workforce Development

16,468



Super AI Engineer Season 5
AI Researcher
AI Engineer
AI Innovator

Organizers



Strategic Partners



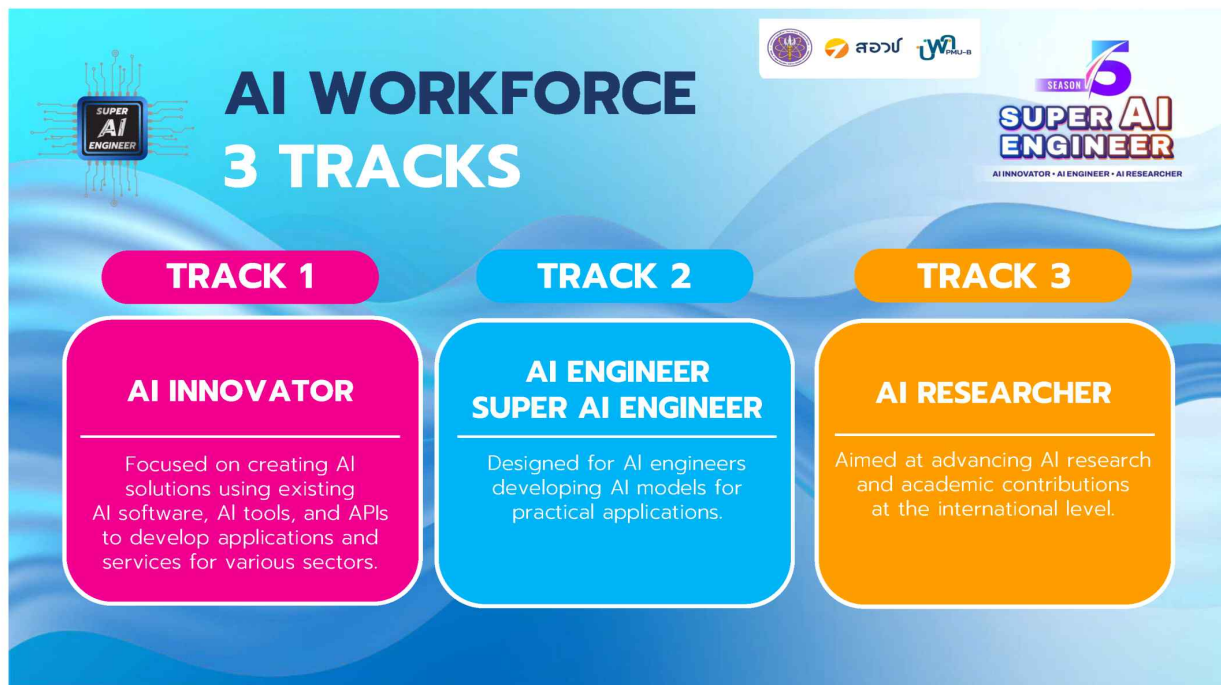
1,205

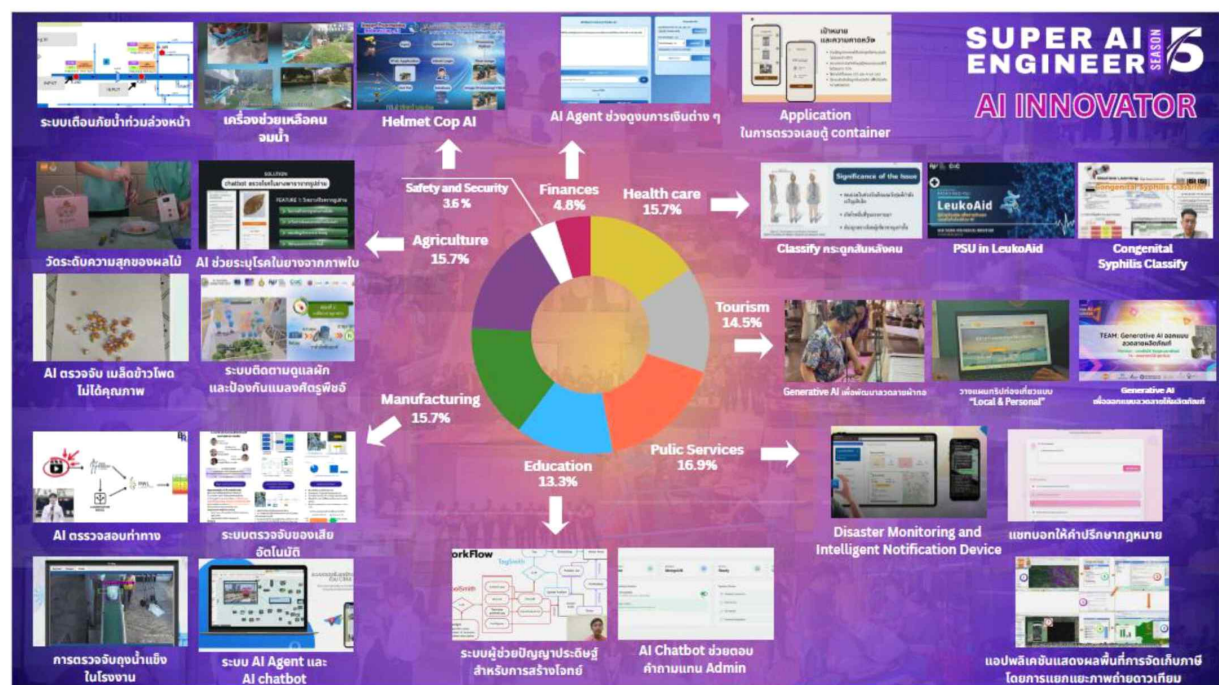
AI Battle

- AI for Thai 712
- Medical AI 403
- AI Benchmark 90

AI Literacy in University : 14149

33





Awareness : Super AI Reality > 300K view

Super AI Engineer Season 1-4

AI Trainer > 4,000 คน

AI Engineer and Education > 14 International & Domestic Opportunity

- Scholarship : ERAMUS, UK, USA, China
- Scholarship : TAIST, JAIST, CMKL, AI Sandbox, SIIT, Chula

AI Engineer in Industry > 150

- KBTG, Kbank, SCB, BBL, BAAC
- TOUCH, SCG, Axon, AltoTech, Thaicom, Lulu, ARV, CJMORE
- DeepInvest, Mitropol, Botnoi, Wongnai, iAPP, AVA, BOL
- EGAT, PEA, MWA, ETDA, NECTEC, BDI
- Ramathibodi Hospital
- Information and Communication Technology Center, Office of the Permanent Secretary, Ministry of Public Health

AI Startup > 10

- DeepInvest, DeepCapital
- Deemmi
- Perceptor AI
- FarmConnect ASIA
- VisualSoulAI
- Scampify
- V89 Technology
- Connected Tech
- Katunyou AI
- Next AI Solution

AI Engineer Research and Country Infrastructure Development

OpenThaiGPT

- AI Conference : ACL, NeurIPS, EMNLP, PRICAI
- Workshop Conference: JCSSE, ISAI-NLP
- Inhouse workshop : RMUTL, KPRU, Parliament

Startup

PreceptorAI

DEEP CAPITAL

NAIS

Deemmi

CONNETED TECH

Soft Power Group

Scamify

1. AI for Universities

AI in Higher Education 2 Subjects

ประกาศกระทรวง อว. เรื่อง แนวปฏิบัติเกี่ยวกับการจัดการเรียนการสอน ด้านปัญญาประดิษฐ์

ในหลักสูตรการศึกษาของสถาบันอุดมศึกษา พ.ศ. 2568

สถาบันอุดมศึกษาจัดทำกรอบเป็นความพร้อมการใช้ AI ในสถาบันอุดมศึกษา ตามวิธีการและรูปแบบที่กระทรวง อว. กำหนด เพื่อประกอบการพิจารณาเข้าร่วม กิจกรรมกับศูนย์ให้คำปรึกษาด้าน AI

สถาบันอุดมศึกษาจัดการเรียนการสอน โดยมีกิจกรรมส่งเสริมผู้เรียน ในการฝึกใช้เครื่องมือด้าน AI

สถาบันอุดมศึกษาบรรจุรายวิชาหรือเนื้อหาที่ประยุกต์ใช้ AI ในหลักสูตร ไม่น้อยกว่า 6 หน่วยกิต หรือไม่น้อยกว่า 2 รายวิชา

สถาบันอุดมศึกษาดำเนินการส่งเสริมการพัฒนาสมรรถนะด้าน AI ให้กับคณาจารย์ บุคลากรสายงานบริหาร และสายงานวิชาการ

สถาบันอุดมศึกษาจัดทำคู่มือช่วยงาน เพื่อใช้คำปรึกษาการใช้งานใช้ AI ในการสนับสนุนการจัดการเรียนการสอน การบริหารการศึกษา และการนำร่องระบบออนไลน์และแพลตฟอร์มที่เกี่ยวข้อง

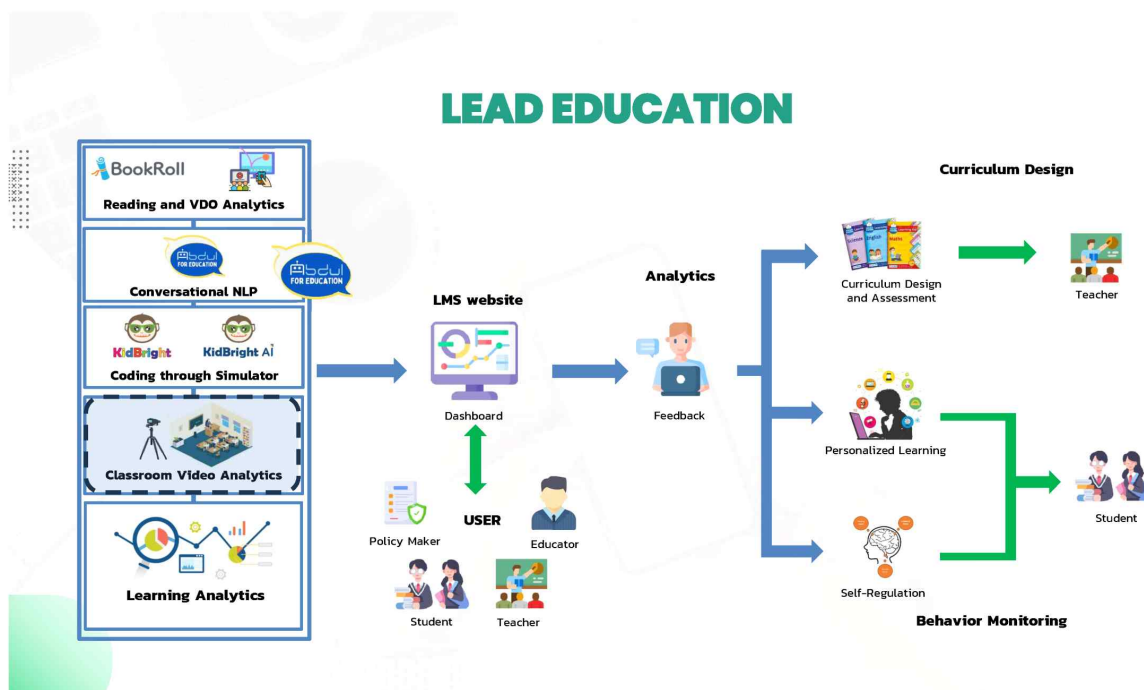
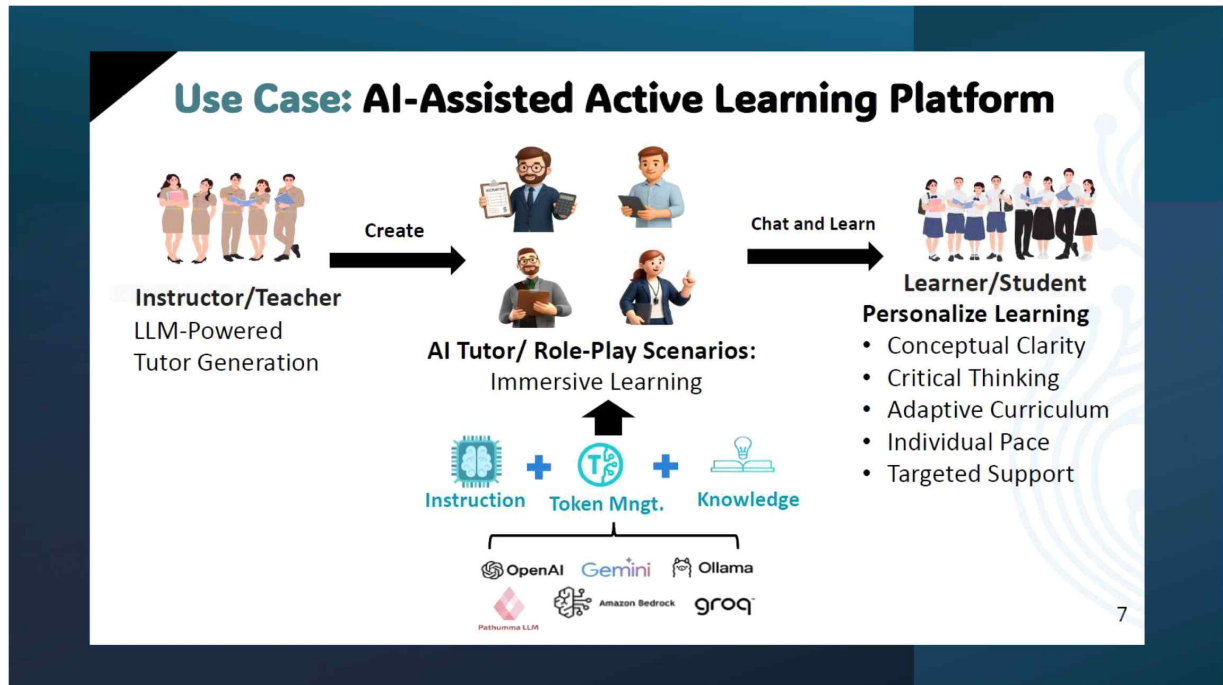
นายสุรศักดิ์ พิษโสทรสุวรรณ รัฐมนตรีว่าการกระทรวง อว.

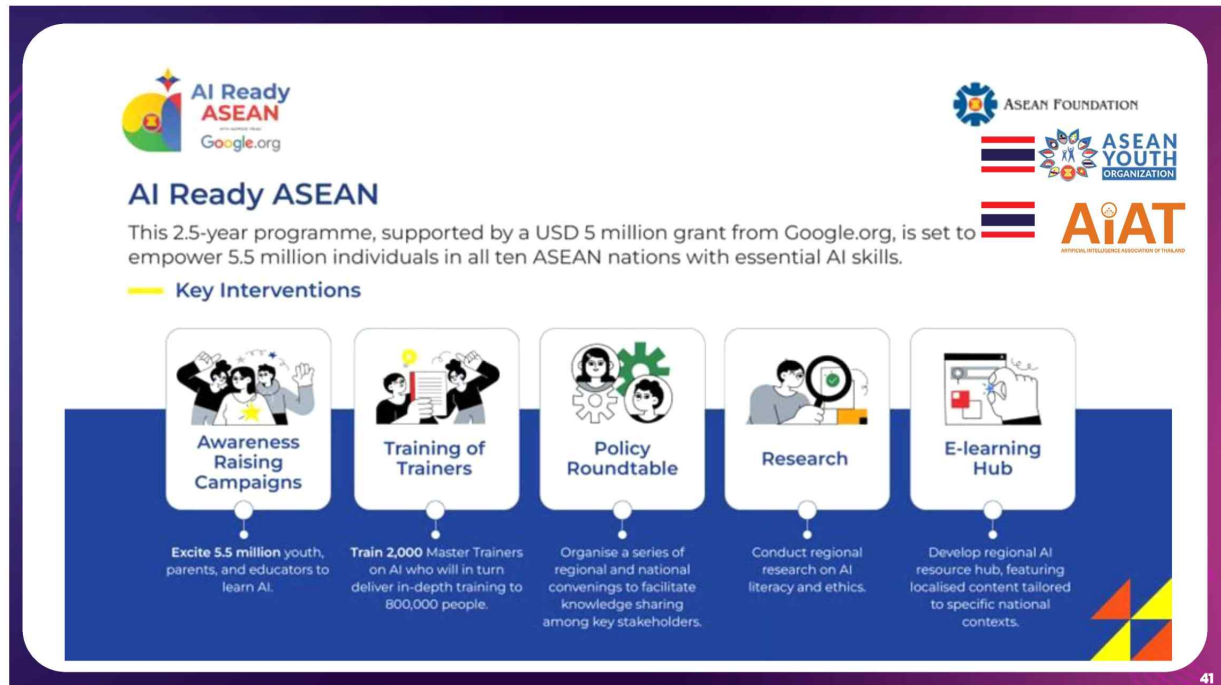
ประกาศ ณ วันที่ 9 ตุลาคม 2568

AI readiness in university
GenAI Token
ABDUL Uni

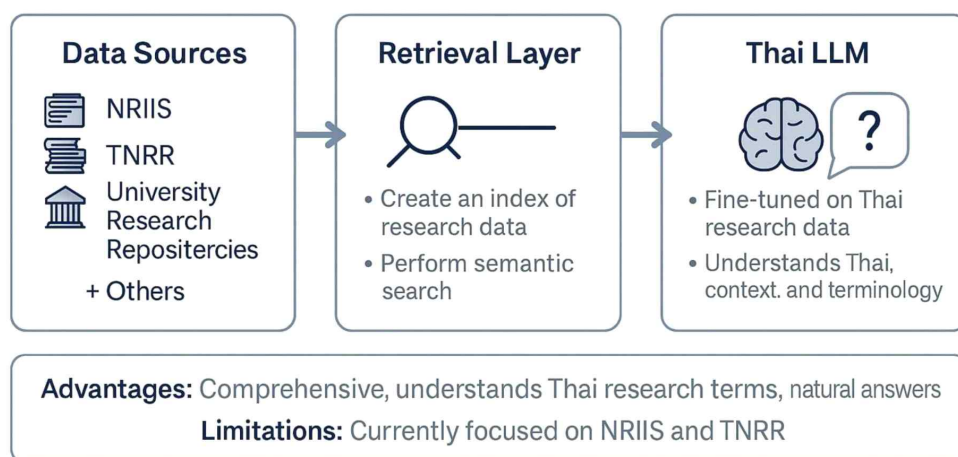
AI Tutor ผู้ช่วยสอนเสมือนจริง ปรับแต่ง Persona, Role play	Virtual Classroom ห้องเรียนเสมือนจริง ห้องเรียนมี Tutor ได้มากกว่า 1	Flexible LLM เชื่อมต่อ LLM อย่างยืดหยุ่น รองรับการเชื่อมต่อ LLM ได้หลายแพลตฟอร์ม
Forum ช่องทางการสื่อสาร พูดคุยระหว่างผู้สอนและผู้เรียน	ABDUL Uni Features	
Permission สิทธิ์การเข้าถึง กำหนดสิทธิ์การใช้งาน Tutor, Classroom	Dashboard สถิติรายงาน ติดตามพฤติกรรมนักเรียน	Learning Corner มุมการเรียนรู้ คลังความรู้ที่รวบรวมการเรียนการสอน
	Group Management จัดกลุ่มผู้เรียน จัดกลุ่มรายวิชาตามเกณฑ์	

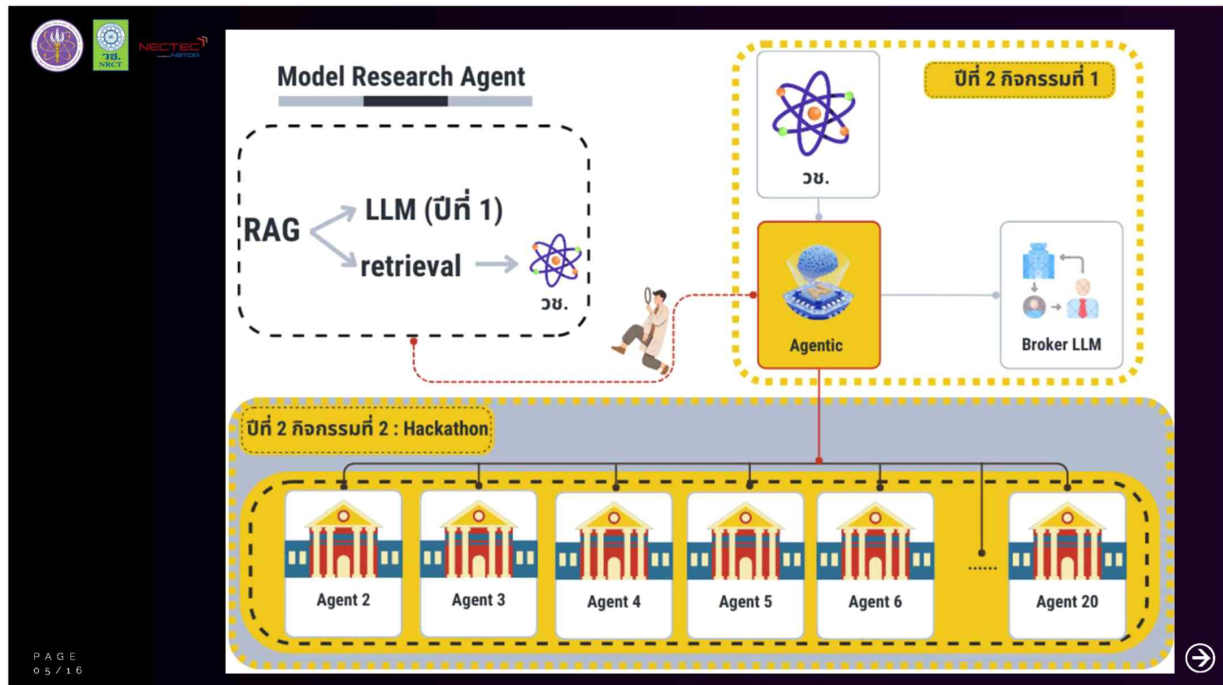
38





Thai Large Language Model-based Research Q&A System





Future Work

- LEAD extended Project
- AI Transformation Project
- AI workforce Project
- Medical AI Project
- AI Governance Project

Session 2

**An AI-Powered Cultural Intelligence
Atlas for Culinary Heritage**

(Dr. Mustafa Eren Yildirim, American Univ.,
Malta)

CULINARIA AI

An AI-Powered Cultural Intelligence Atlas for Culinary Heritage

Preserving Traditions • Understanding Cultures • Connecting People

2 WHY CUISINE MATTERS

An Intangible Cultural Heritage

- ✦ Culinary traditions reflect history, identity, and values.
- ✦ Food connects geography, climate, resources, and human creativity.
- ✦ Recipes evolve through migration, trade, and cultural exchange.
- ✦ Traditional knowledge is at risk of disappearing.
- ✦ AI can help preserve, understand, and share this living heritage.



3 RESEARCH MOTIVATION

- ✦ Fragmented data and scattered archives
- ✦ Lack of cultural context in food databases
- ✦ Limited comparative understanding
- ✦ Need for AI-driven reasoning and explainable insights

Our Vision

An intelligent atlas that combines AI, knowledge graphs, and cultural heritage to explain why dishes exist, how they evolved, and what they mean to people.

4 UNESCO FOOD ATLAS

International Food Atlas

- ✦ Documents foodways as intangible cultural heritage.
- ✦ Rich collection of case studies from around the world.
- ✦ Focus: documentation and safeguarding.
- ✦ Limitation: static information without AI reasoning.



Reference: UNESCO, 2025

5 EUROPEANA

Europe's Digital Heritage

- ✦ Provides access to millions of cultural heritage items.
- ✦ Includes cookbooks, photos, and manuscripts.
- ✦ Focus: digitization and aggregation.
- ✦ Limitation: general heritage platform, not cuisine-specific.



Reference: Europeana Foundation, 2024

6 TASTEATLAS

Food and Travel Guide

- ✦ Crowdsourced food ratings and restaurant guide.
- ✦ Maps dishes and ingredients around the world.
- ✦ Focus: tourism and discovery.
- ✦ Limitation: limited cultural context and historical depth.



Reference: TasteAtlas, 2024

7 CULTURATI

Horizon Europe Project

- ◆ AI-powered platform for digital cultural heritage.
- ◆ Advanced tools for metadata enrichment.
- ◆ Focus: general heritage collections.
- ◆ Limitation: not specialized in culinary heritage.



Reference: CULTURATI Project, 2024

8 CULTURAL AI LAB (ICAI)

Amsterdam

- ◆ Research on AI for museums and heritage.
- ◆ Projects on computer vision, NLP, and storytelling.
- ◆ Focus: museum applications and cultural analytics.
- ◆ Limitation: not cuisine-focused.



Reference: ICAI - Cultural AI Lab, University of Amsterdam, 2024

9 RESEARCH GAP

No existing platform integrates:

- ✓ AI reasoning and explainability
- ✓ Geographic and historical context
- ✓ Culinary knowledge graphs
- ✓ Oral histories and living traditions
- ✓ Comparative cuisine analysis
- ✓ Sustainability and future impact

CULINARIA AI addresses this gap.



10 OUR VISION: CULINARIA AI

An AI-powered Cultural Intelligence Atlas that maps cuisines as living ecosystems.

- ✦ Understand Origins
- ✦ Preserve Heritage
- ✦ Empower Communities



- ✦ Explain Evolution
- ✦ Enable Comparison
- ✦ Inspire Sustainability

AI + Heritage + Geography + People = Cultural Intelligence

11 SYSTEM ARCHITECTURE

- 1 Geographic Intelligence
- 2 Historical Intelligence
- 3 Cultural Intelligence
- 4 Culinary Intelligence
- 5 Heritage Intelligence
- 6 AI Intelligence Layer



12 AI COMPONENTS

- ◆ Large Language Models for reasoning and storytelling
- ◆ Computer Vision for image and object analysis
- ◆ Speech Recognition for oral history transcription
- ◆ Knowledge Graph AI for semantic reasoning
- ◆ Recommendation Engine for cultural journeys



13 DATA SOURCES



Multilingual • Multimodal • Interdisciplinary • Ethical

14 EXPLAINABLE AI PIPELINE



Transparent • Traceable • Trustworthy

15 MALTA: CULINARY HERITAGE

- ✦ Mediterranean island nation with rich historical influences: Arab, Sicilian, British.
- ✦ Seasonal and local ingredients.
- ✦ Community feasts and religious traditions.
- ✦ Traditional recipes passed down through generations.



16 KOREA: CULINARY HERITAGE

- ✦ Rich culinary traditions shaped by nature, seasons, and history.
- ✦ Fermentation and balance at the heart of cuisine.
- ✦ Regional diversity and royal heritage.
- ✦ Food as a reflection of harmony and health.



17 MALTA – KOREA: COMPARATIVE INSIGHTS

Shared Themes

- ✦ Use of seasonal and local ingredients
- ✦ Preservation through fermentation, drying, pickling
- ✦ Community meals and family traditions
- ✦ Adaptation through history and trade



Distinctive Expressions

- ✦ Mediterranean flavors and olive oil traditions (Malta)
- ✦ Rice-based cuisine with fermented staples (Korea)
- ✦ Different climate and agricultural resources
- ✦ Unique rituals, festivals and food symbolism

18 APPLICATIONS & USE CASES

Research & Academia

Support for historians, anthropologists, and food scholars.

Museums & Exhibitions

Immersive storytelling and interactive displays.

Education

Engaging content for students and teachers.

Tourism & Communities

Sustainable tourism and local empowerment.

19 HORIZON EUROPE ALIGNMENT

EXCELLENCE

- ◆ Interdisciplinary research combining AI, heritage, and humanities.
- ◆ Innovative knowledge graph and AI reasoning.

IMPACT

- ◆ Preserve intangible heritage.
- ◆ Promote cultural diversity and inclusion.
- ◆ Support sustainable tourism and local development.

IMPLEMENTATION

- ◆ Strong consortium across Europe and Asia.
- ◆ Co-creation with communities, museums, and experts.
- ◆ Open, ethical, and interoperable platform.

Digital Europe • Creative Europe • European Research Area • Sustainable Development Goals

20 FUTURE RESEARCH & SUSTAINABILITY

Expand to more regions and cultures

Community-driven living archive

Continuous AI learning and responsible use

Inclusive collaboration with communities and researchers

CONCLUSIONS

CULINARIA AI transforms how we understand and preserve culinary heritage. By combining AI, cultural knowledge, and human stories, we build bridges between past and future, and between cultures.

Let's nurture traditions. Let's connect cultures. Let's build a smarter tomorrow.

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Session 2

**From 3D Skeletonization to Extended Reality:
A Research Journey Towards
Malaysia–Korea Collaboration in Culture**

(Dr. Seow Saw Hui, Universiti Tunku Abdul
Rahman(UTAR), Malaysia)

3rd ISCT 2026 · Korea–Malaysia Film & Video Contents Collaboration Strategies

From 3D Skeletonization to Extended Reality

A Research Journey Toward Malaysia–Korea Culture Technology Collaboration

Ts Dr Saw Seow Hui (蘇小慧 @ 후이)

Assistant Professor, Department of Computer Science
Universiti Tunku Abdul Rahman (UTAR), Kampar, Malaysia

ISCT 2026 · Dongseo University

August 2026

Who I Am

A journey rooted in geometry, graphics, and human-centred design



14th Year at UTAR

Assistant Professor, Dept. of Computer Science, Faculty of ICT — teaching, research, and postgraduate supervision.



2025 Teaching Excellence Award

Recognised for sustained impact in teaching and student development.



Graphics Programming for Extended Reality

Current teaching focus: real-time rendering, Unity development, AR/VR, and interactive system design.

14+

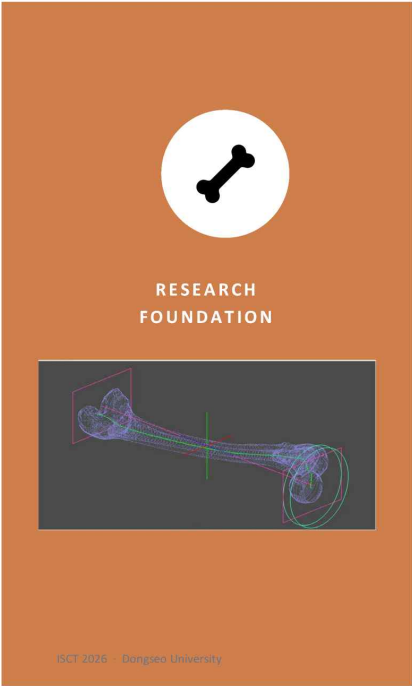
years of academic
service at UTAR

Research Interests

3D Shape Analysis · XR & AI ·
Human-Computer Interaction ·
Biomedical Interfaces

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1 / 5



Where It Began: Skeletonization

PhD Research

"Femur Shape Analysis System using Maximum-Minimum Centre Skeletonization"

Extracting the "skeleton" of a complex 3D shape simplifies its geometry — enabling precise analysis of structures like the human femur, while preserving the features that matter most.

IEEE Access (2022)	Skeleton-Based 3D Femur Shape Analysis System
SIAM Conference (2019)	Computational Geometric Design, Vancouver

The same skeleton-based method underlies character rigging and mesh deformation in animation — a direct bridge into culture-technology applications.

2 / 5

A Research Journey, in Three Steps

From geometric foundations, through applied human-centred systems, to extended reality



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3 / 5

Proposed Collaboration

Three concrete ways to build on today's Global R&D Council launch



Joint XR Research

Apply skeleton/shape-based techniques to character animation & virtual production — feeding directly into Dongseo's Generative AI filmmaking workshop.



Postgraduate Exchange

Extend UTAR's Virtual Project Attachment model (precedent: Chongqing) to Dongseo's Film & Video Contents and GBA graduate students.



AAFF Tie-In

Contribute a technical or judging role, or propose a UTAR student submission track for the Asia AI Film Festival.

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4 / 5

A Two-Way Partnership

What UTAR & Malaysia contribute to the Global R&D Council



Technical & HCI Rigor

Geometric modelling, XR development, and human-centred design methods.



Student Talent

Motivated undergraduate and postgraduate researchers in CS, graphics, and mobile development.



Healthcare-XR Testbeds

Active hospital digitalisation and biomedical interface projects ready for joint application.

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5 / 5



From Skeleton to XR — Building Bridges Across Malaysia and Korea

I welcome the opportunity to discuss a joint proposal under the new Global R&D Council.

Ts Dr Saw Seow Hui · shsaw@utar.edu.my

Assistant Professor, Department of Computer Science, UTAR Kampar

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Thank you

Session 2

**AI for Inclusive Care: Understanding and
Monitoring Challenging Behaviors Beyond the
Classroom**

(Dr. Yoosoo Oh, Daegu Univ., South Korea)



AI for Inclusive Care: Understanding and Monitoring Challenging Behaviors Beyond the Classroom

Yoosoo Oh, Ph.D.
Daegu University

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PROBLEM STATEMENT: THE GAP IN CARE - THE REALITY OF MANUAL OBSERVATION



The Human Challenge

Individuals with severe intellectual and developmental disabilities (IDD) exhibit challenging behaviors (violence, self-injury) that require constant, 24-hour monitoring to prevent harm. Relying strictly on human manpower has clear limits.



The Data Challenge

Fragmented Data: Heavy reliance on the subjective memory and manual records of teachers or guardians.

The Prediction Gap: Inability to accurately anticipate repetitive behaviors.

Operational Bottleneck: Scattered data makes it extremely difficult to form objective analysis and consistent intervention plans.

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24-HOUR ALL-IN-CARE ECOSYSTEM PIPELINE

What if there were
'eyes that never tire'
in the classroom?

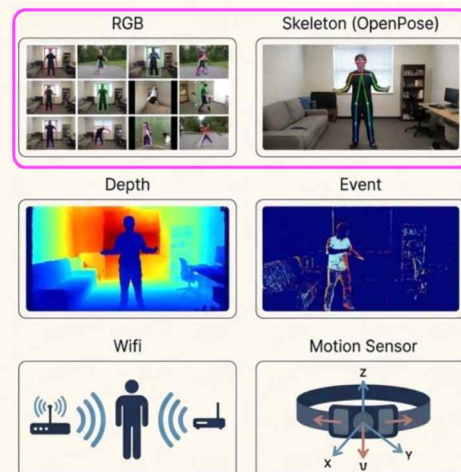
Eyes that never miss, never tire, and keep judging — 24 hours a day!

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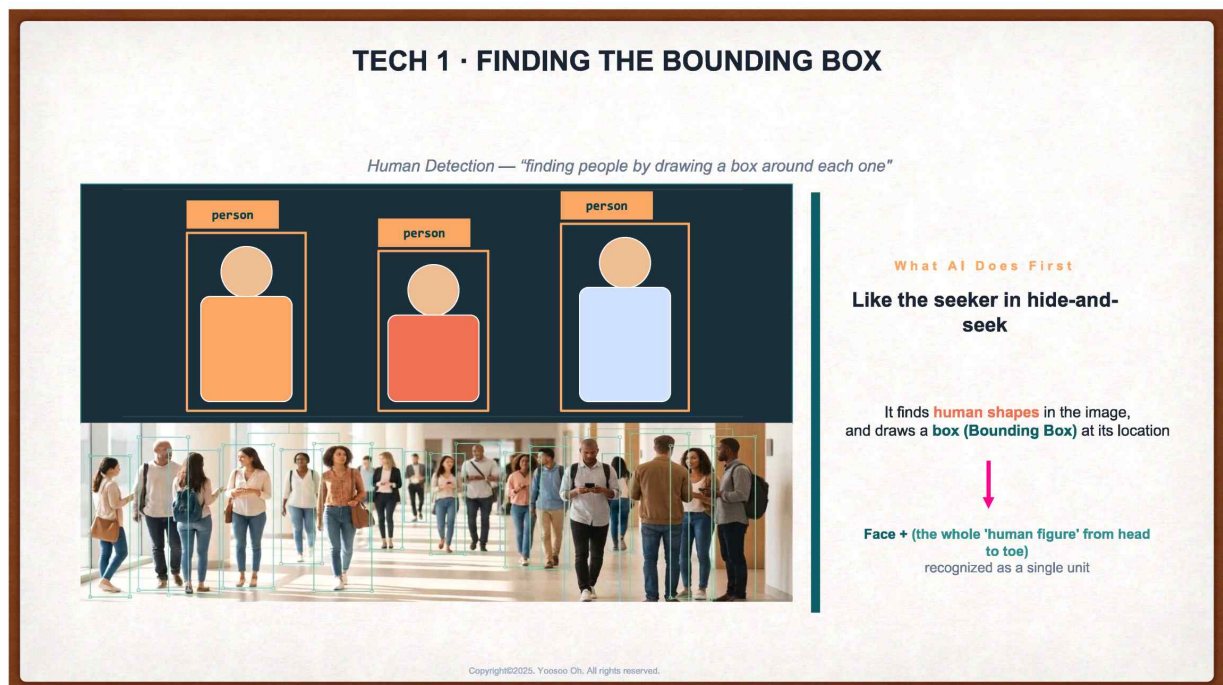
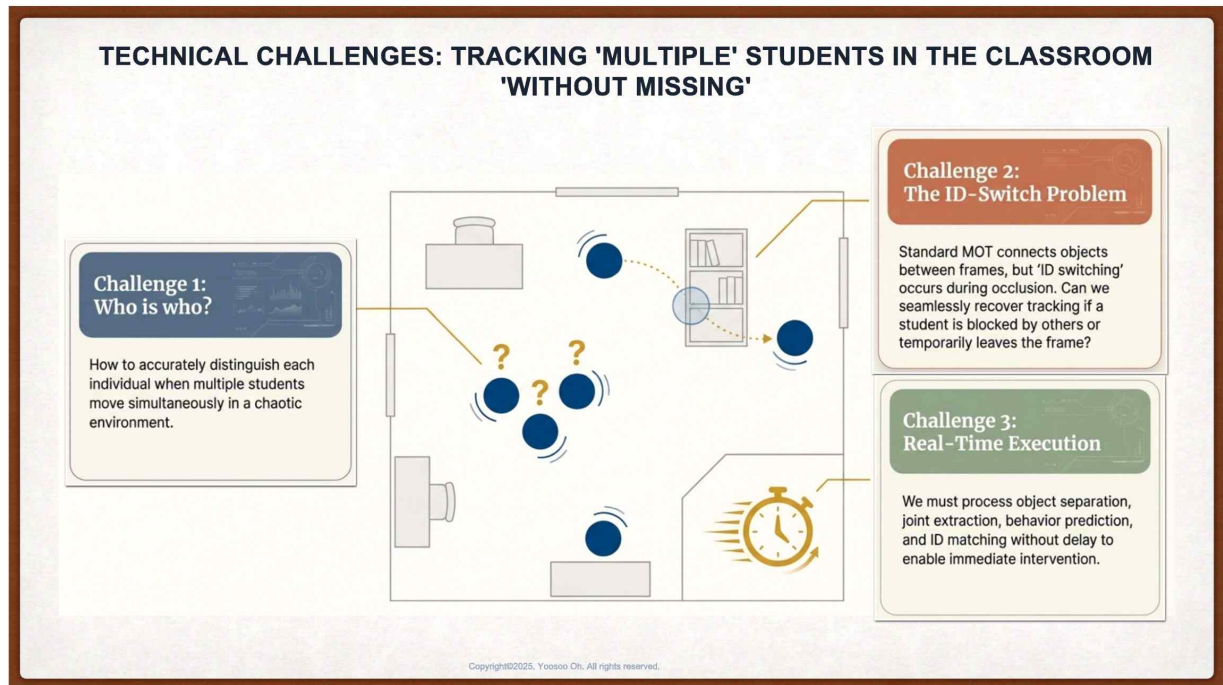
HUMAN ACTION RECOGNITION (HAR) FOR IDD CHILDREN

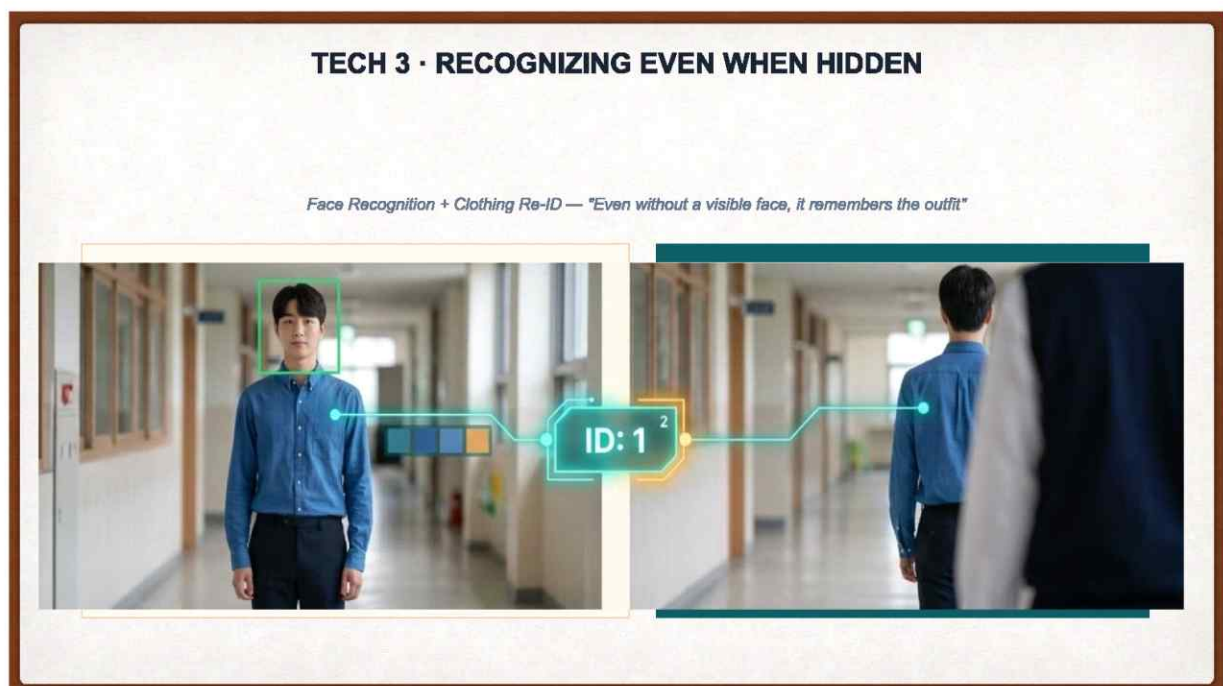
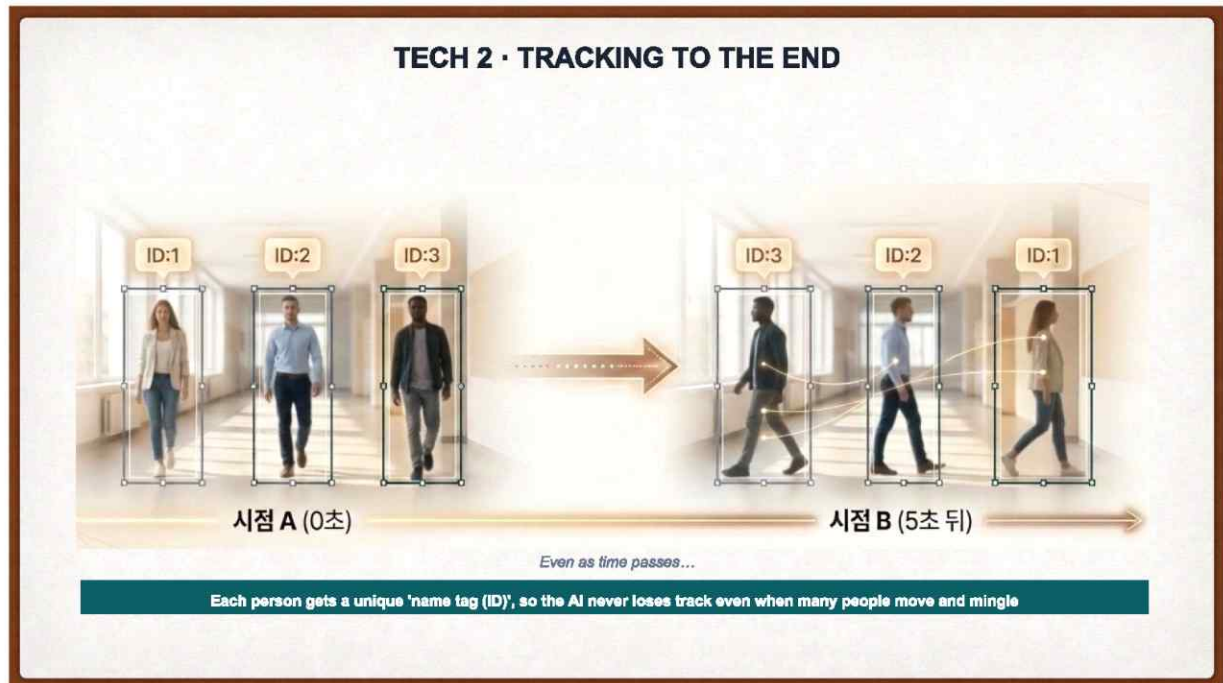
- **Algorithm:** Skeleton-based action recognition designed specifically to support IDD children with challenging behaviors.
- **System:** End-to-end AI-based behavior observation & analysis system.
- **Synthesis:** Developmental Disability Behavior Recognition/Classification (Engineering) + Behavior Analysis (Humanities).

IDD(Intellectual and Developmental Disabilities)



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Comic strip frames

Frame 1

Frame 2

Frame 3

Frame 4

Frame 5

Frame 6

Frame 7

Frame 8

Playing back the still frames in sequence creates motion

Playing: Frame 1 / 8

Why the skeleton?

Unaffected by face · clothing
· background,
it never wavers,

using only the changes in joint
positions
to grasp 'what a person is
doing'

CHALLENGING BEHAVIOR DATA DEFINITION

Need for AI-Based Behavior Observation System

- Real-time monitoring
- Automated analysis
- Alerts & insights

Aggressive Behaviors

Hitting

Choking

Kicking

Pushing

Pulling hair

Slapping cheek

pulling, scratching, swinging, throwing, smashing, tearing, biting

Self-Injurious Behaviors

Head banging against wall

Hitting oneself

Hitting wall with hand

Stereotypic Behaviors

Hand shaking

Head shaking

Clapping

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LARGE-SCALE BEHAVIOR VIDEO DATA CONSTRUCTION

Collection Period: June 15, 2023 – October 5, 2023

124 Participants

22,894 Total Videos

20+1 Behavior Classes
(20 Challenging + 1 No-action)

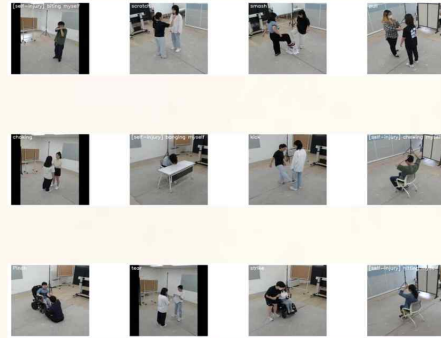
Self-injurious (5 types):

Self-hitting, Self-biting, Self-banging,
Self-chewing, Self-bumping.

Aggressive (15 types):

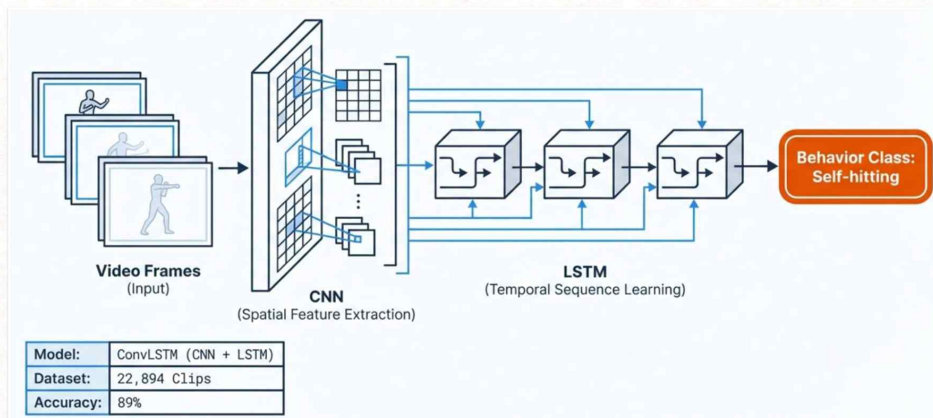
Hit, Push, Kick, Bite, Throw, Pinch, Pull,
Smash, Extort, Choking, Tear, Strike,
Scratch, Swing, etc.

Preprocessing Quality Control:
Secured by rigorously removing outliers such as strict back views and total occlusions.



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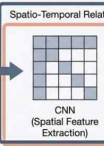
1ST YEAR: SPATIO-TEMPORAL ACTION RECOGNITION

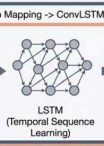


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[1ST YEAR IMPLEMENTATION RESULTS (2022~2023)]







Behavior Classification
(e.g., 'Self-hitting')

Spatio-Temporal Relationship Mapping -> ConvLSTM

Accuracy: 89%

3 hit



1 choking



2 extort



5 Pinch



12 tear



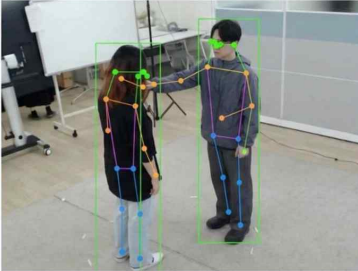
13 throw



ConvLSTM-based Single Person Action Recognition based on Spatio-Temporal relationships

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2ND YEAR: MULTI-HUMAN INTERACTION ANALYSIS



35 Complex Joint Features

- 15 Joint Coordinates
- 8 Joint Angles
- 12 Joint Distances

Shift: From single-action to Actor-Victim relationship modeling.

3D-CNN + Skeleton Tracking

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International Association for
Convergence Science & Technology

99

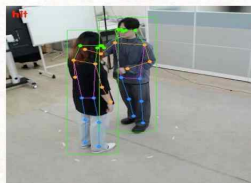


DSU Dongseo University
44-11952

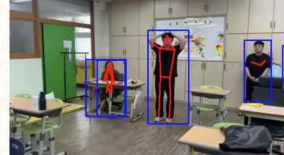
[2ND YEAR IMPLEMENTATION RESULTS (2023~2024)]

[Test Site: Gyeongju Gyeonghui School (Real space test)]

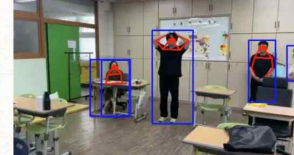
Skeleton Joints + 3D-CNN based Multi-Person Action Recognition



Movenet-SinglePose-thunder-YOLOv8n



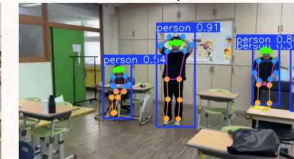
Mediapipe-SinglePose-YOLOv8n



MoveNet-MultiPose-lightning

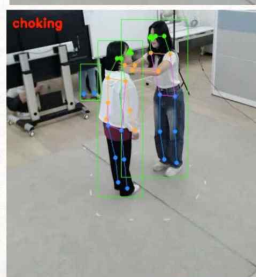
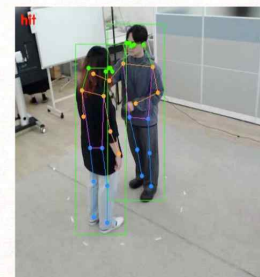
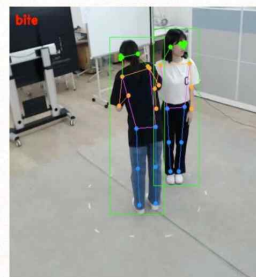


YOLOv11n-pose



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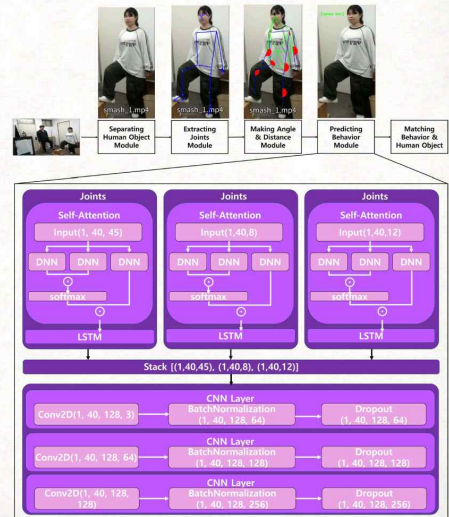
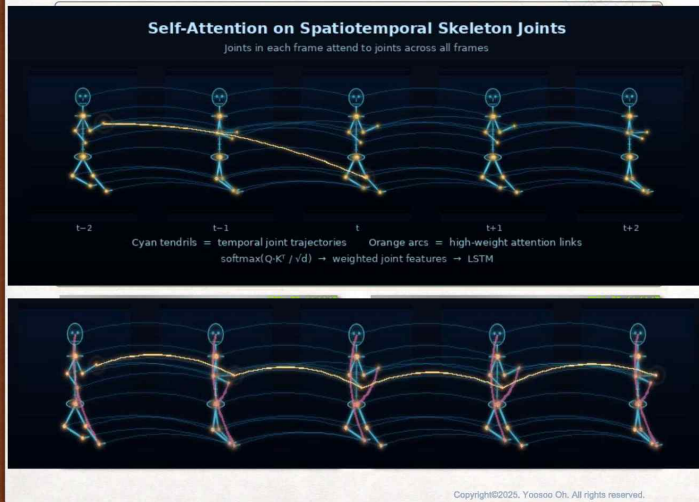
[2ND YEAR IMPLEMENTATION RESULTS (2023~2024)]



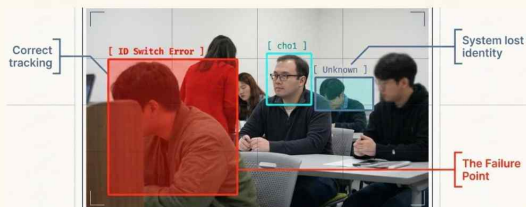
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[3RD YEAR IMPLEMENTATION RESULTS (2024~2025)]

Multi-Object Tracking (MOT) & Action Recognition



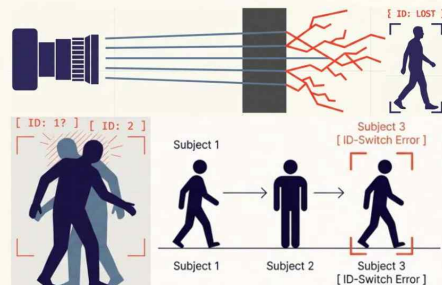
TECHNICAL CHALLENGE: MULTI-OBJECT TRACKING (MOT) & ACTION RECOGNITION



Constant Movement: Subjects are restless, changing postures and directions.

The Constraint: Subjects frequently leave the camera frame entirely.

The Intersection: Subjects constantly cross paths, physically blocking the camera's line of sight.



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REQUIRED TECH - MOT & COMPLEX JOINT INFO

- MOT: Detects and tracks multiple objects in video sequences. Connects objects across frames to track movement over time



(a)

(b)



Joint Info:

(a) Mediapipe BlazePose: 33 joint coordinates.

(b) 35 Complex Joint Info = 15 coordinates + 8 angles + 12 distances

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COMPARISON OF MOT ALGORITHMS



YOLO + DEEPSORT



YOLO + DEEPSORT + RE-ID



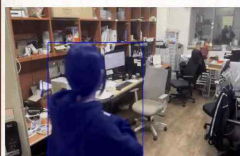
YOLO + DEEPSORT + HSV



YOLO + DEEPSORT + HSV + Height



BoT-SORT



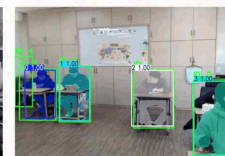
YOLOv8n + SAMURAI



YOLOv8n + MASA



YOLOv8n + MASA + HSV



SAM2



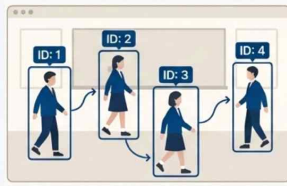
SAMURAI

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OUR SOLUTION: 3-STEP IDENTITY ASSOCIATION PIPELINE

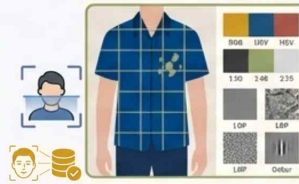
1. Multi-Object Tracking (Who is Who)

YOLO + DeepSORT detects and tracks multiple students' positions simultaneously, assigning stable, unique IDs.



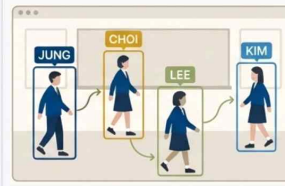
2. Face & Clothing Re-Identification

When Face is Visible: InsightFace embedding.
When Face is Hidden: Clothing Re-ID using color (RGB/HSV) and texture (LBP/Gabor) features maintains stability.



3. Continuous Recording

Fusing these three technologies ensures continuous data capture without omission, even during severe occlusion or complex movements.



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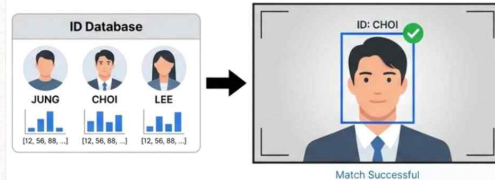
SOLUTION STEP 1 - FACE RECOGNITION

To overcome the limitations of Multi-Object Tracking (MOT), individual facial data is utilized to clarify identities.

Using the InsightFace model, a unique average embedding vector is extracted from 5~15 registered images per person. Detected faces are compared against this vector for ID matching. (e.g., JUNG, CHOI, LEE, KIM)

While highly effective, a fundamental problem exists: ID matching fails when the face is occluded or not visible (e.g., back or side profiles).

Successful Match



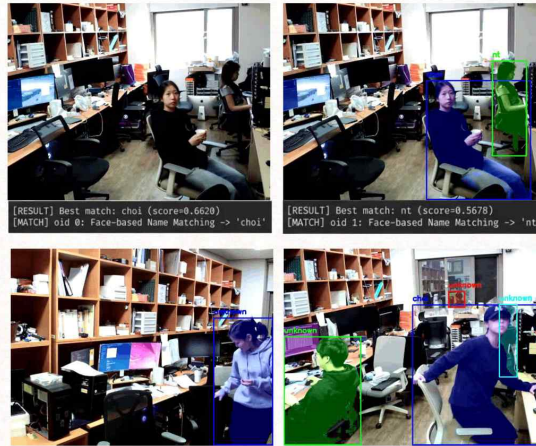
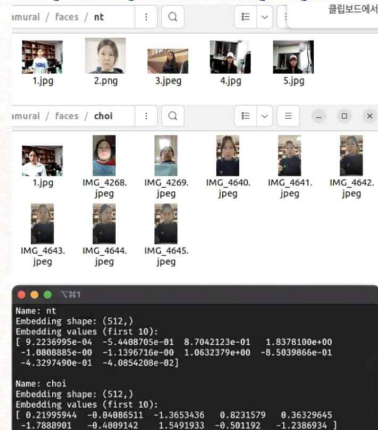
Match Failure (Face Not Detected)



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STEP 1 LIMITATION EXAMPLE

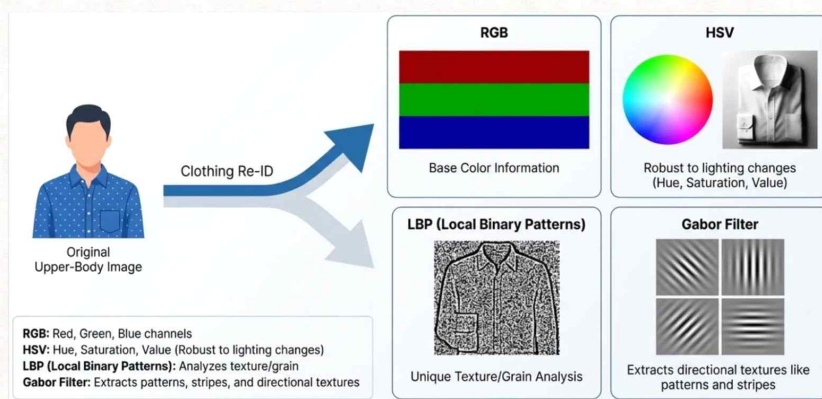
- Apply average embedding vector extraction from InsightFace using at least 5~15 multi-angle images



- Visual example of successful matching vs. failure when the face is not detected.
- "Unknown mark when face is not visible."

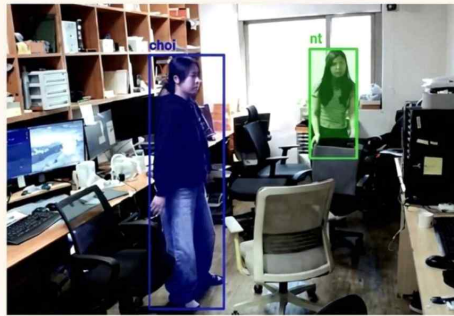
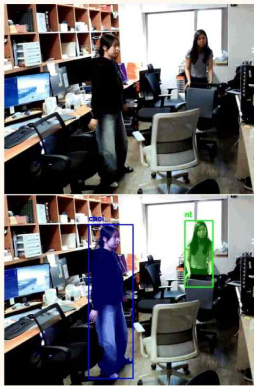
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SOLUTION STEP 2 - ROBUST TRACKING WITH CLOTHING RE-ID



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STEP 2: MOT + FACE RECOGNITION + CLOTHING RE-ID



The Challenge

Response to face non-detection using Upper Body Features.

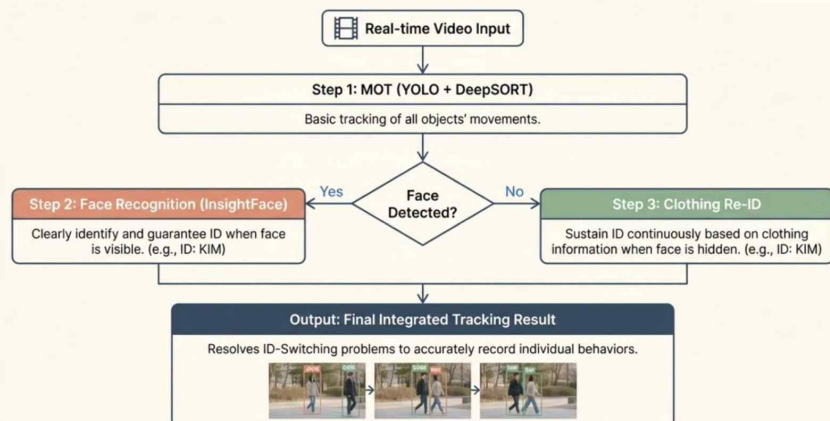
The Technology

Enhanced recognition using RGB + HSV + LBP + Gabor filters even in partial lighting or severe occlusion.
(Gabor Filter extracts patterns, stripes, and directional textures).

```
[RESULT] Best match: choi (score=0.4923)
[MATCH] oid 0: Clothing-based similarity matching -> 'choi'
(score=2.9970)
[RESULT] Best match: nt (score=0.5153)
[MATCH] oid 1: Face-based name matching -> 'nt'
```

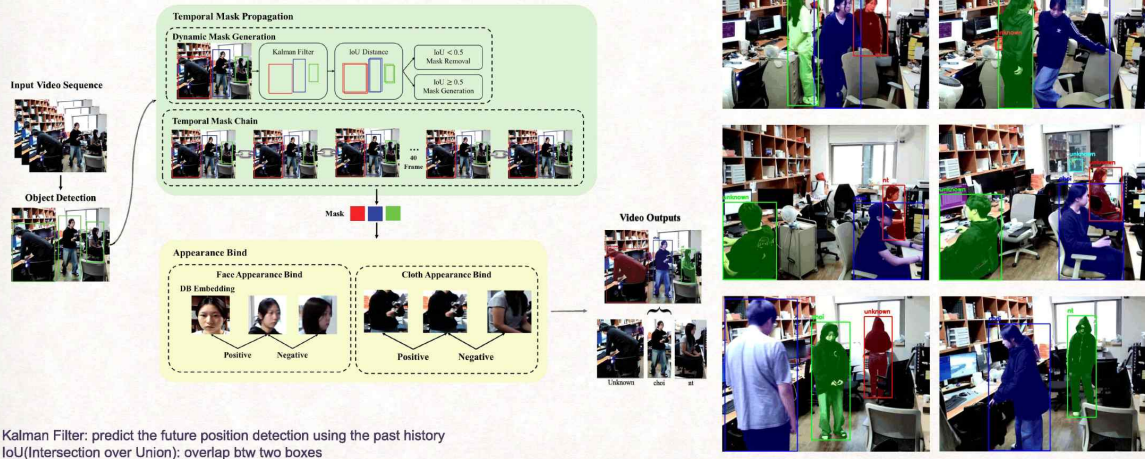
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SOLUTION STEP 3 - FUSION PIPELINE



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FINAL PIPELINE VISUALS

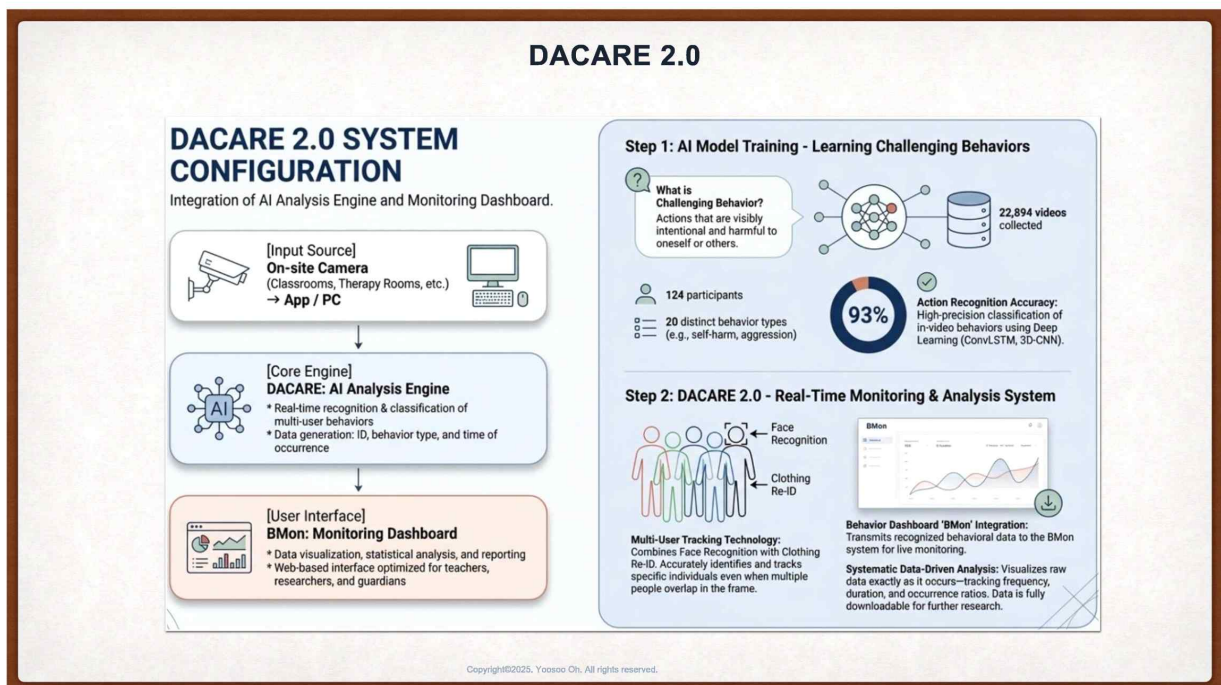
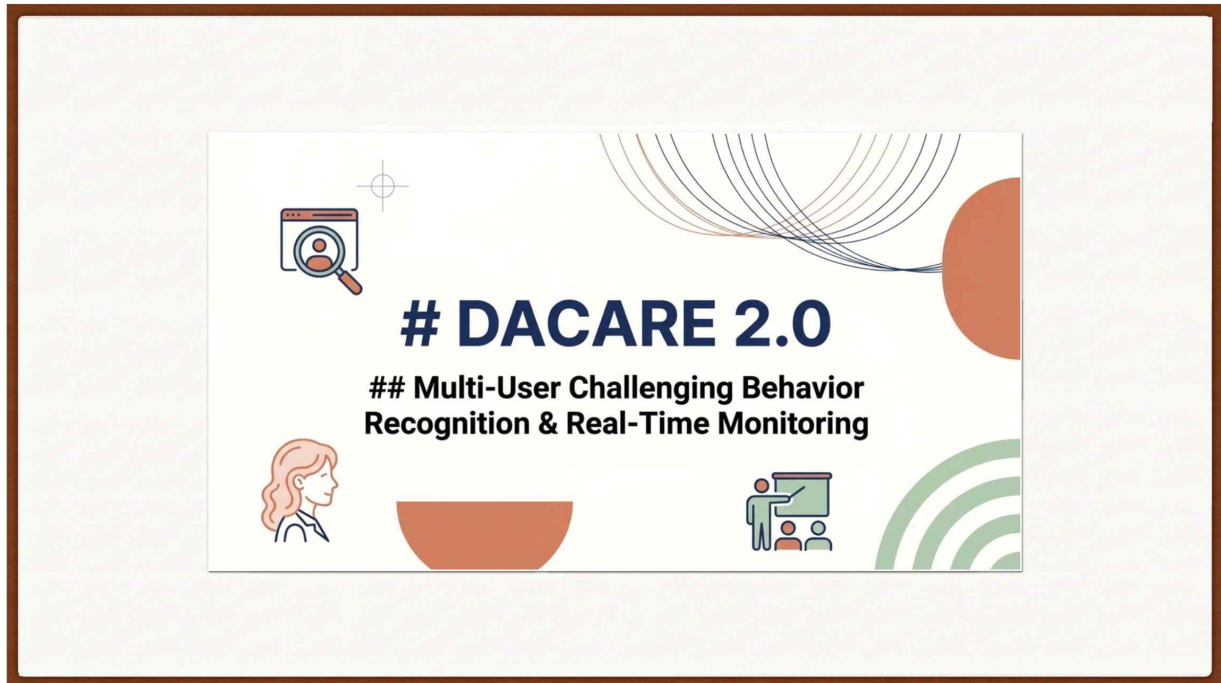


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[BOUNTING BOX COLOR CODES] GREEN: SINGLE PERSON BEHAVIOR, RED: ACTOR (IN 2-PERSON BEHAVIOR), BLUE: VICTIM (IN 2-PERSON BEHAVIOR)

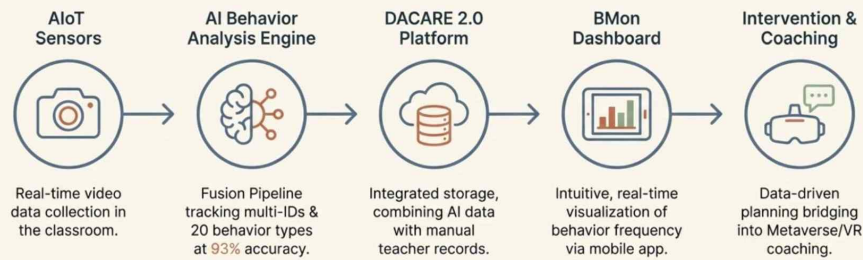
Result





THE INTEGRATED ECOSYSTEM: DACARE 2.0 & BMON

A One-Stop Platform linking Analysis to Intervention



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BMON: BEHAVIOR DASHBOARD MONITOR

Feature 1: Real-time Monitoring

Teachers and guardians can instantly verify the current status of students. Logs show exact timestamps, behavior types (e.g., 'Out of Seat', 'Aggressive Behavior', 'Screaming'), and specific student IDs.

Mobile Accessibility

Includes a mobile app for teachers and parents to check data anytime, protected by a strict immediate-deletion privacy policy.

Real-time Event Log

Timestamp	Student ID	Behavior Type	Duration
10:45:02 AM	ID-0	Out of Seat	00:15s
10:45:15 AM	ID-1	Aggressive Behavior	00:25s
10:45:22 AM	ID-0	Screaming	00:08s
10:45:30 AM	ID-2	Out of Seat	00:20s
10:45:41 AM	ID-0	Normal Activity	--
10:45:52 AM	ID-1	Normal Activity	--



Feature 2: Core Metric Analysis

Visualizes data through precise Frequency Graphs, Duration Graphs, and Ratio Graphs to break down the exact percentage of time spent on specific behaviors.

Feature 3: Intervention Effect Analysis

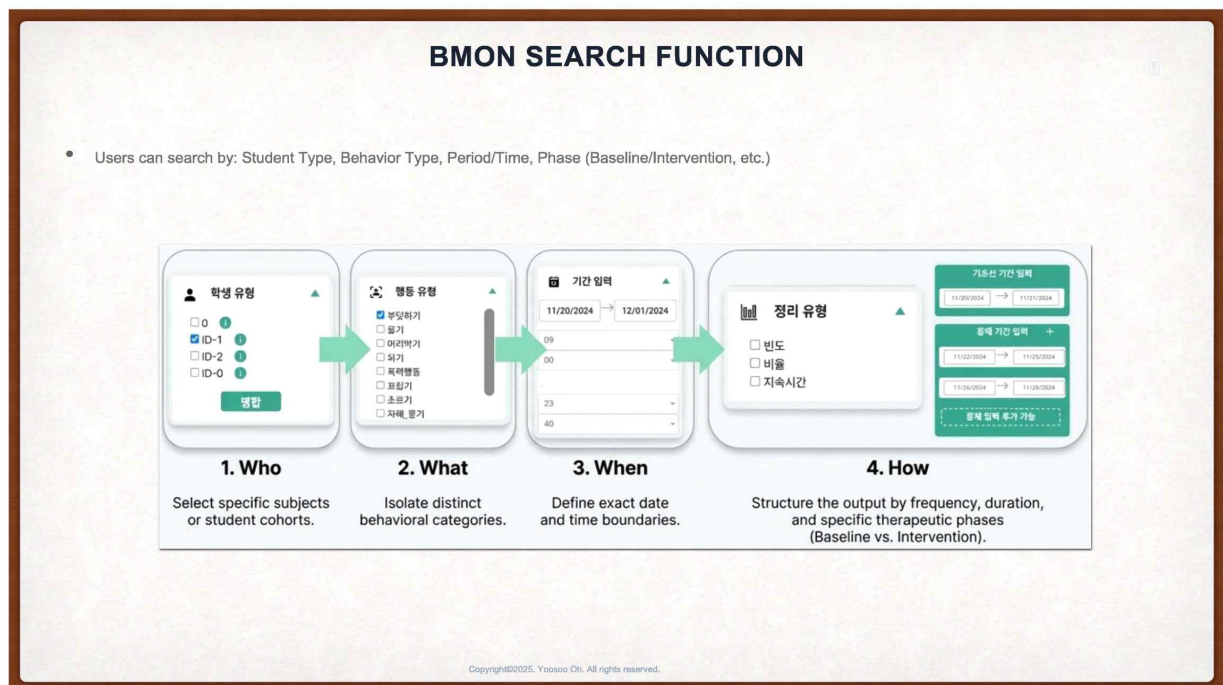
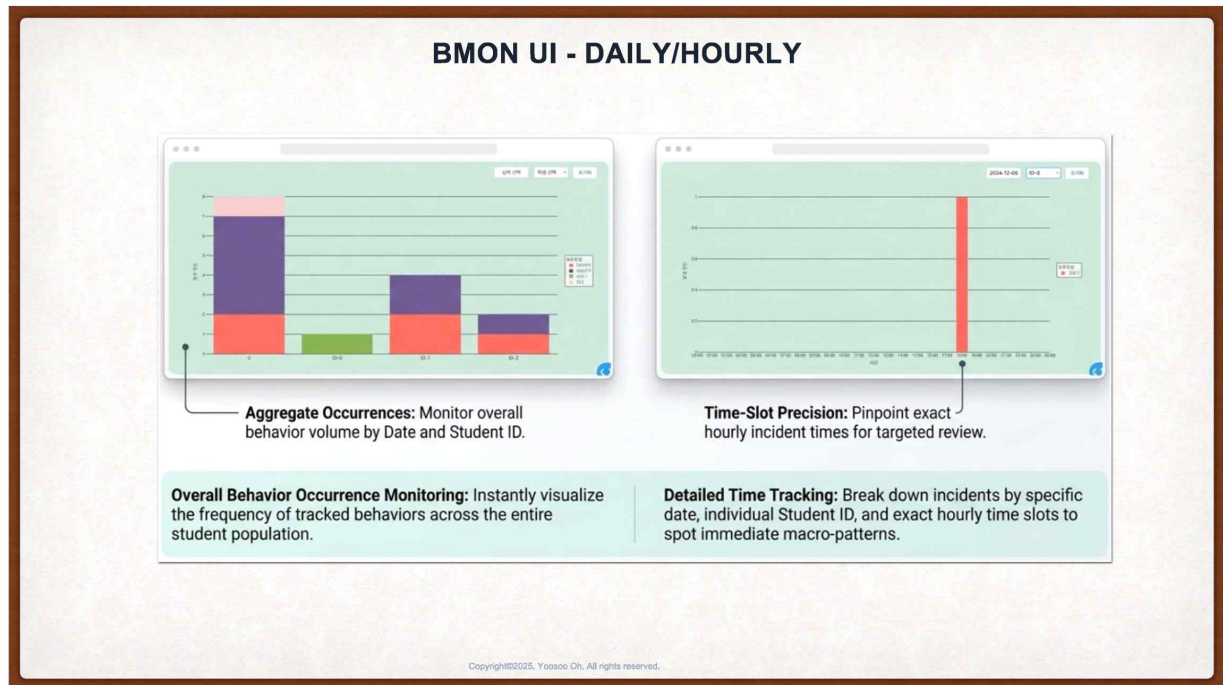
Objectively evaluates progress across key clinical phases: Baseline -> Intervention -> Maintenance -> Generalization. Allows educators to definitively see if a strategy is working based on hard trend lines rather than subjective feeling.

Feature 4: Data Export

All raw data can be downloaded as Excel files for deeper academic or clinical analysis.



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BMON PHASE ANALYSIS GRAPHS

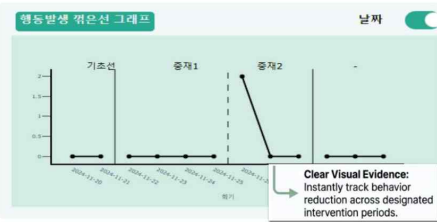
Automated Phase Graphs:
Automatically generate average and range tables, alongside line graphs divided by your custom-set periods (Baseline, Intervention 1, Intervention 2).

Comprehensive Frequency Tables: Track date, specific behavior, daily count, phase assignment, and phase average in one unified view.

Range/Average Summaries:
Instantly assess the upper and lower bounds of behavior occurrences to evaluate true clinical progress.

날짜	행동유형	행동발생빈도 (09:00-00-23:40:00)	중개	평균	기간
2024-11-20	부딪히기	0	0	0	기초선
2024-11-21	부딪히기	0			
2024-11-22	부딪히기	0			
2024-11-23	부딪히기	0			
2024-11-24	부딪히기	0	0	0	중재1
2024-11-25	부딪히기	0			
2024-11-26	부딪히기	2			
2024-11-27	부딪히기	0			
2024-11-28	부딪히기	0	2	0.67	중재2
2024-11-29	부딪히기	0			
2024-11-30	부딪히기	0			

	기초선	중재1	중재2	-
평균	0	0	0.67	0
범위	0-0	0-0	0-2	0-0



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BMON: PREDICTION PROBABILITY

Confidence Scoring: The system calculates a prediction probability to verify the accuracy and similarity of the logged behavior.

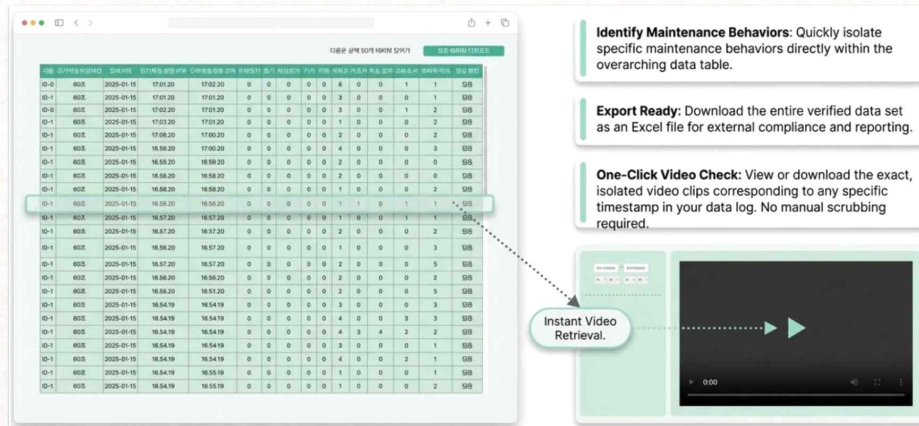


Prediction Probability Engine: Go beyond manual logging. Check the algorithmic confidence score of every newly recorded behavior.

Behavioral Similarity: Automatically identify pattern matches with historical data to ensure consistent definitions and accurate tracking across all subjects.

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BMON: MAINTENANCE BEHAVIOR SEARCH & VIDEO



Identify Maintenance Behaviors: Quickly isolate specific maintenance behaviors directly within the overarching data table.

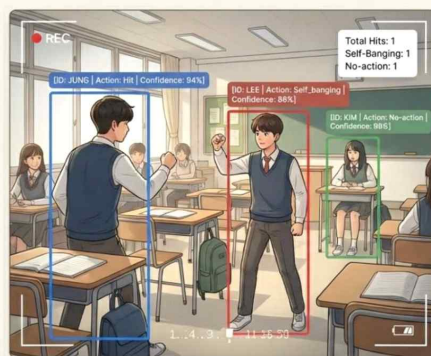
Export Ready: Download the entire verified data set as an Excel file for external compliance and reporting.

One-Click Video Check: View or download the exact, isolated video clips corresponding to any specific timestamp in your data log. No manual scrubbing required.

Instant Video Retrieval.

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FIELD VERIFICATION: DACARE 2.0 IN THE CLASSROOM



Deployment Sites: Successfully tested in real educational environments, including Daegu Namyang School and Gyeongju Kyunghee School.

- **Real-Time Tracking:** Fixed classroom cameras simultaneously recognize multiple students, maintaining consistent IDs.
- **Live UI Output:** On-screen display of Target ID (e.g., ID: JUNG), Predicted Action (e.g., Push), and Behavior Frequency.
- **Micro-Analysis Engine:** Utilizes 35 points of Joint Complex Information (extending 33 Mediapipe BlazePose coordinates with 8 joint angles and 12 joint distances) for highly granular behavioral analysis.

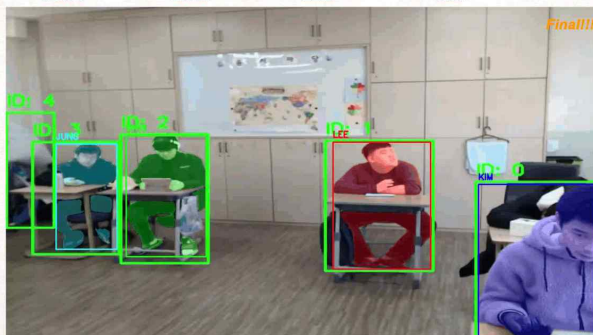
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FIELD DEPLOYMENT IN SPECIAL EDUCATION SCHOOL



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FIELD VERIFICATION - GYEONGJU GYEONGHUI SCHOOL



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ID Recognition & Tracking Results



FIELD VERIFICATION - DAEGU NAMYANG SCHOOL



Maintenance behavior at 11:13:47

Displays ID with most behaviors + Prediction + Frequency

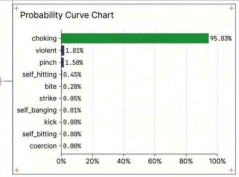
< DACare → BMon Transfer Data >

```
{'Institution': 'Kyunghee School',
'Sustained Action Date': '2024-12-03',
'Window Duration': 60,
'Start Time': '18:00:54',
'End Time': '18:01:54',
'Action Counts': 'ID:0 | choking: 4 \n
ID:1 | choking: 1 \n
ID:0 | violent: 2 \n
ID:0 | pinch: 3 \n
ID:1 | self_banging: 3 \n
ID:2 | self_banging: 1 \n
ID:0 | bite: 1'}
```

Behavior	ID: 0	ID: 1	ID: 2
Choking	4	1	0
Violent	2	0	0
Pinch	3	0	0
Self-Banging	0	3	1
Bite	1	0	0

System successfully isolates overlapping behaviors across multiple subjects. ID:0 is identified as the highest-frequency actor during this 60-second window.

```
{'Institution': 'Kyunghee School',
'Start Time': '2024-12-03 18:01:19',
'End Time': '2024-12-03 18:01:22',
'ID': 0,
'Predicted Action': 'choking',
'Prediction Probabilities':
'choking: 95.83%\n
violent: 1.81%\n
pinch: 1.58%\n
self_hitting: 0.45%\n
bite: 0.20%\n
strike: 0.09%\n
self_banging: 0.01%\n
kick: 0.00%\n
self_biting: 0.00%\n
coercion: 0.00%'}
```



The AI exhibits definitive primary prediction confidence (95.83%) while effectively filtering out behavioral noise and false positives (<2%).

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RESEARCH ACHIEVEMENTS

Technological



Developed AI behavior recognition module (BMon) & integrated platform (DACARE).
3 patent applications filed.
Built an AIoT-Cloud E2E pipeline.

Academic



Published 50 papers (SCI 18, KCI 32) and 9 books.
Selected for Top 50 Excellence by the Ministry of Education (2025).

Social



Eased teacher workloads via the 90% behavior reduction. Contributed to disability awareness and social integration.
Built a massive collaborative network (23 MOUs).

Economic



Expected annual cost savings of ~790 billion KRW via automated observation replacing manual tracking.
Established viable SaaS and hardware bundle business models.

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SUSTAINABLE EXPANSION OF AIX RESEARCH



On-Device AI

Model lightweighting and quantization for edge devices. Performs direct inference to minimize latency and guarantee privacy protection.



Dual Business Model

Deploying subscription-based SaaS models for large institutions alongside lightweight hardware bundles (camera, gateway, dashboard) to lower the barrier to entry.

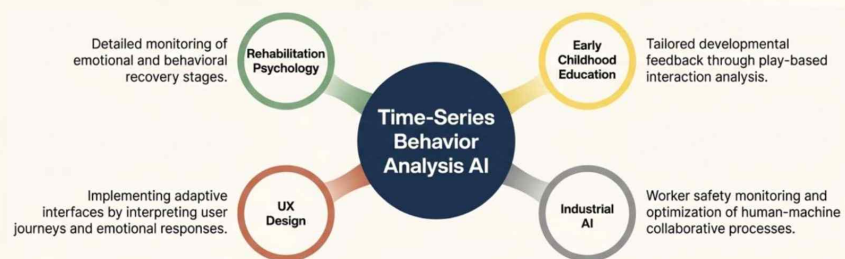


Mobile Application

Allowing teachers and guardians to check data anytime, anywhere.
Built with a strict immediate-deletion policy to protect sensitive health data.

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RIPPLE EFFECTS OF AIX RESEARCH



“ **Human-centered AI is an interaction infrastructure that amplifies human capabilities.** ”

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