

PROFESSOR

Prof. Hak Gu Kim

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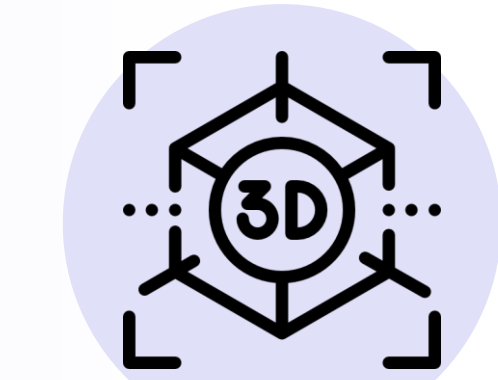
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ABOUT IRIS LAB

We **bridge Generative AI and Reality** by developing human-centered intelligent systems that understand humans and the physical world, and seamlessly connect the physical and digital worlds.

Our research explores ① **Reality Modeling and World Simulation**, ② **Human Understanding**, and ③ **Physical AI** to enable intelligent systems that can perceive, reason, and interact with the real world.



Reality Modeling



Human Understanding



Physical Intelligence

RESEARCH PIPELINE



CAPTURE
REALITY



MODEL
REALITY



UNDERSTAND
REALITY



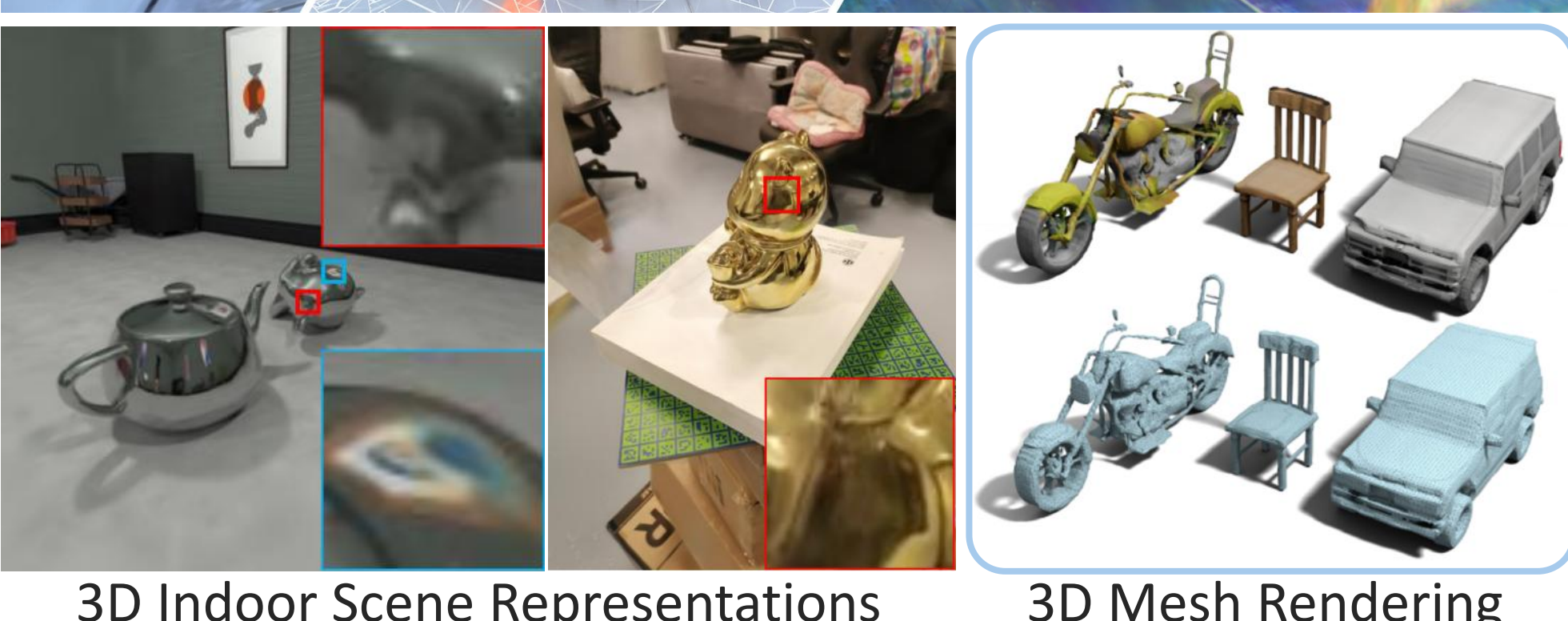
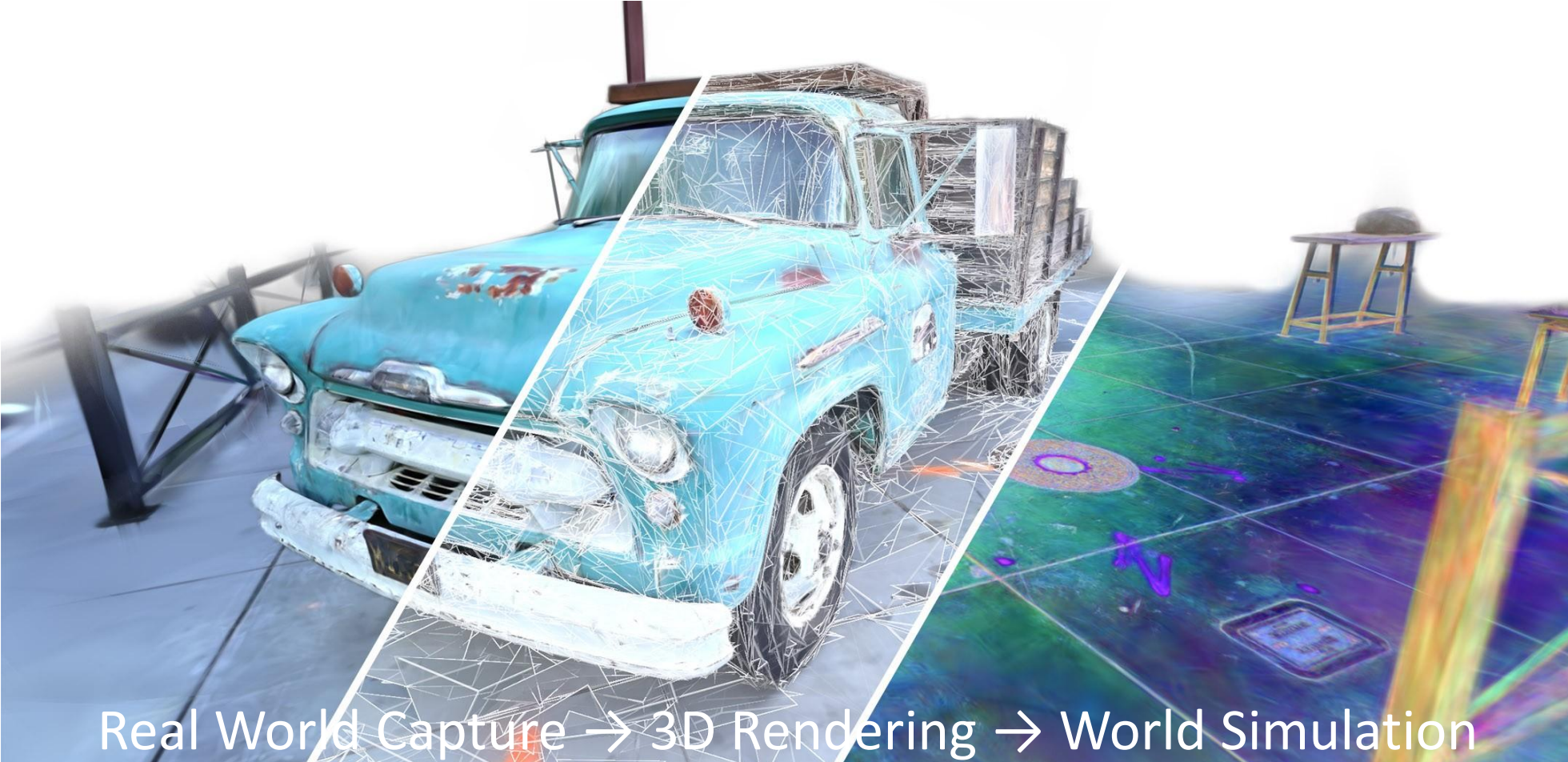
INTERACT WITH
REALITY

From capturing and modeling reality to
understanding and interacting with the physical world

KEY RESEARCH AREAS

1 Reality Modeling & World Simulation

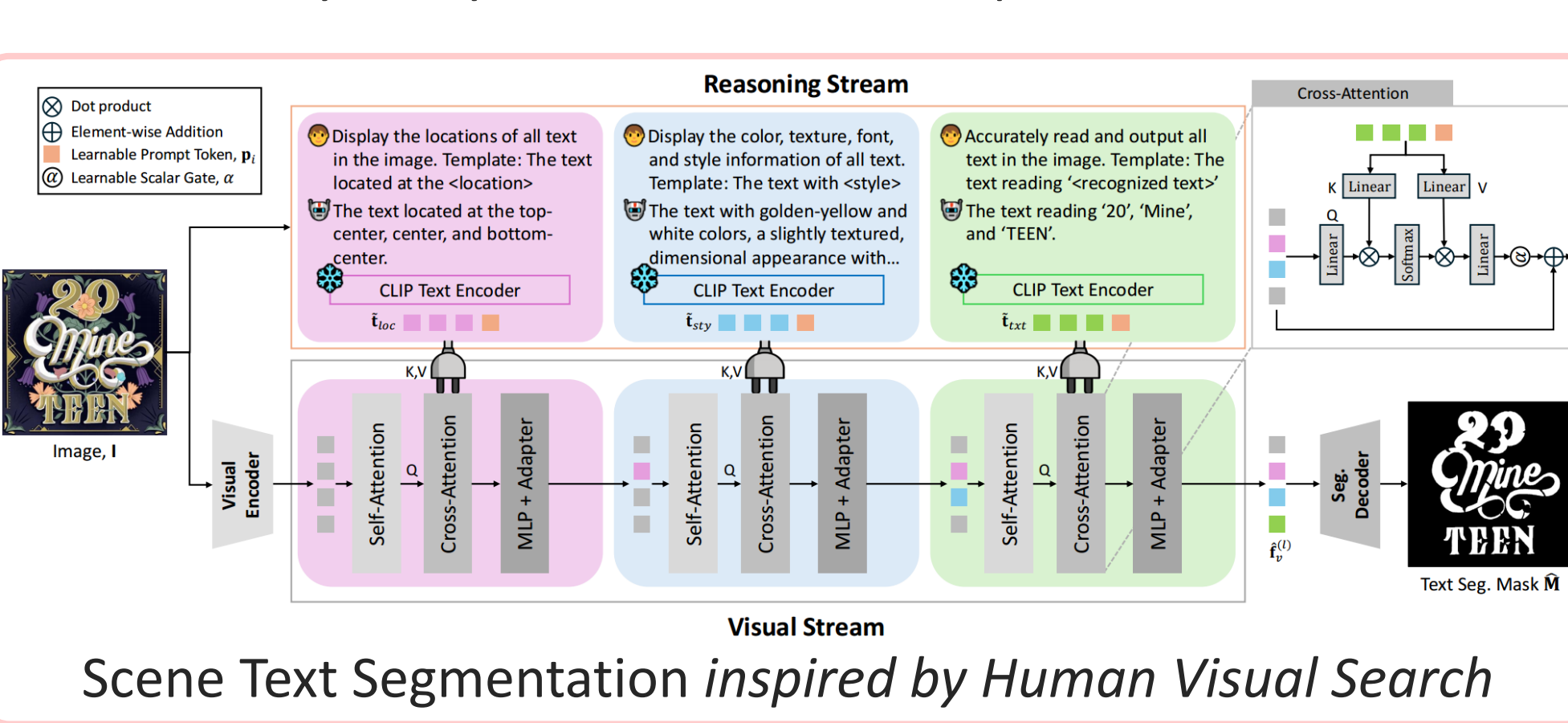
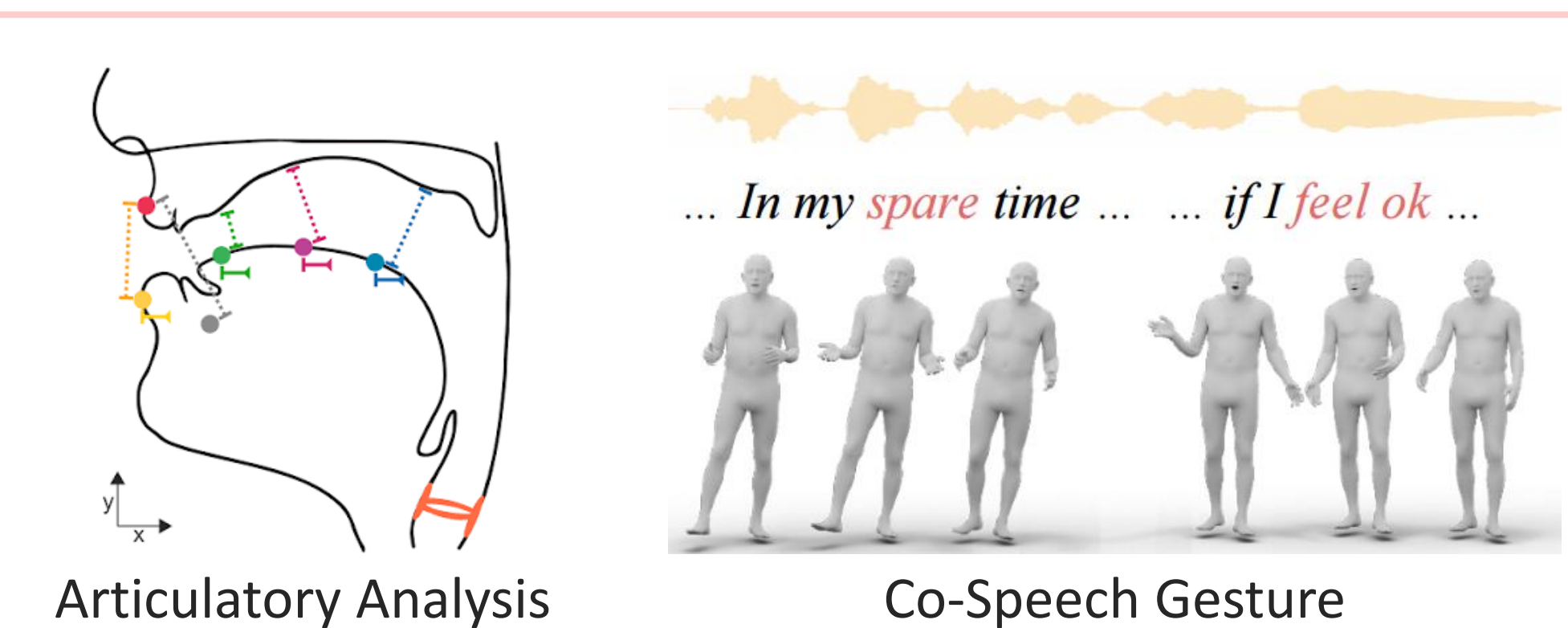
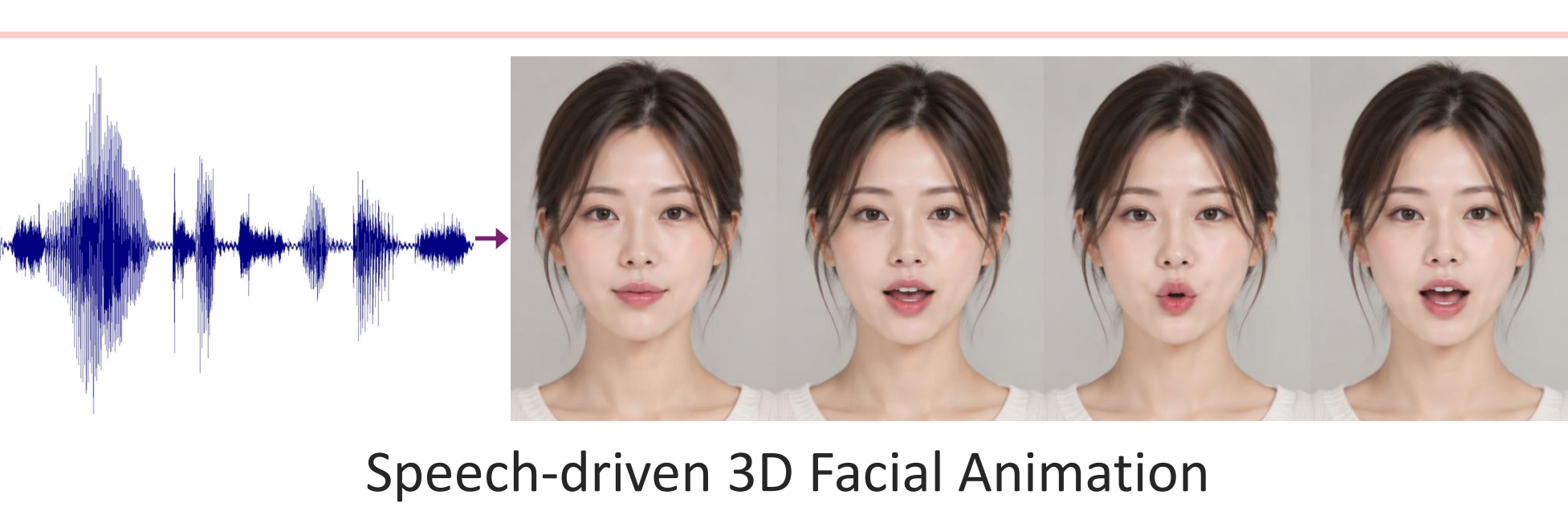
3D/4D reconstruction and generation, neural rendering, digital twin and world modeling



- Neural Rendering & Gaussian Splatting for Dynamic Scenes
- Digital Twins & Realistic World Simulation
- Reflective & Specular Surface Reconstruction
- Animatable 3D Avatar Generation

2 Human Understanding & Computational Cognition

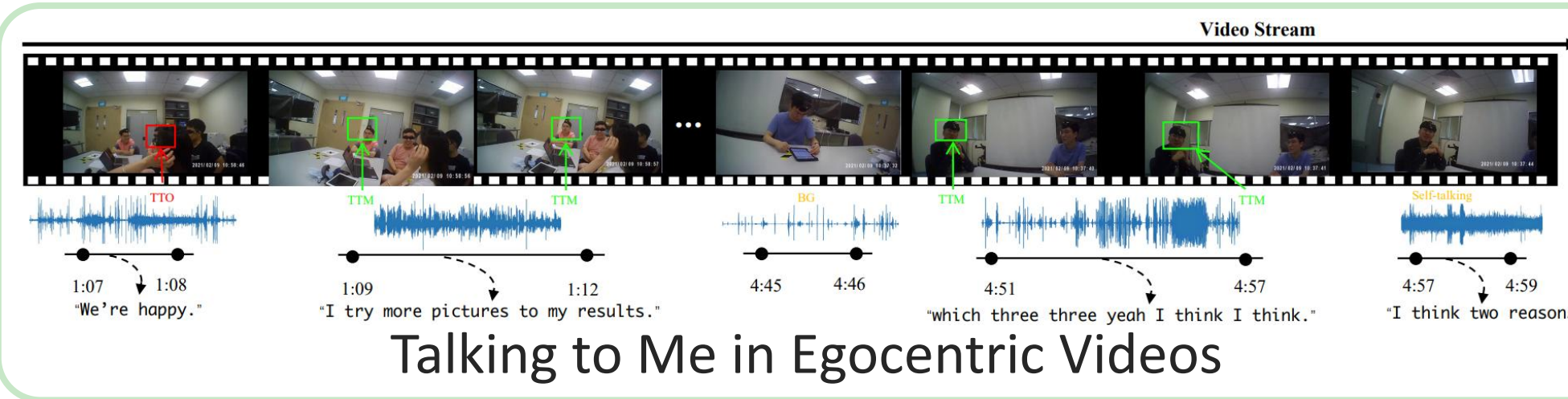
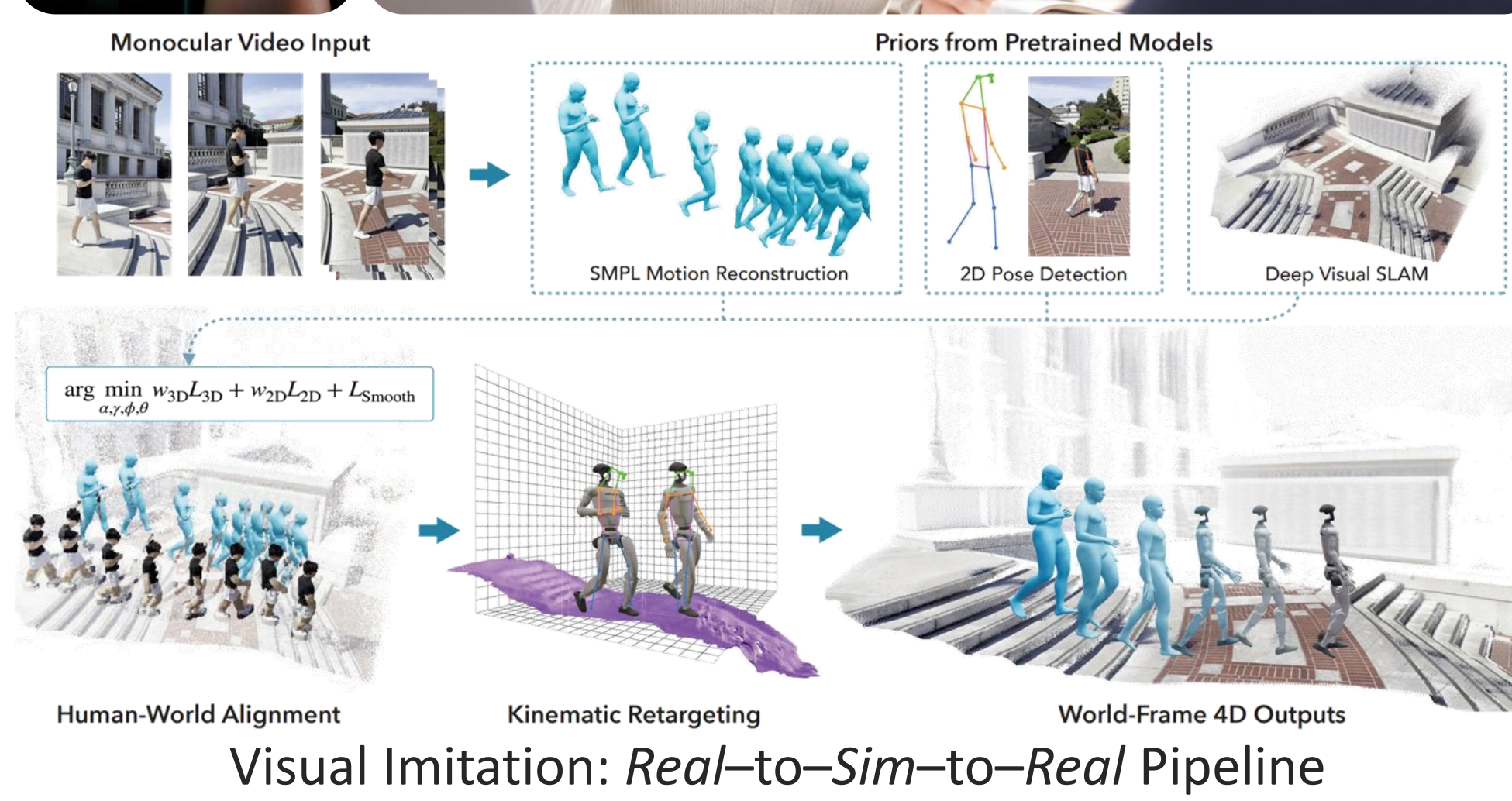
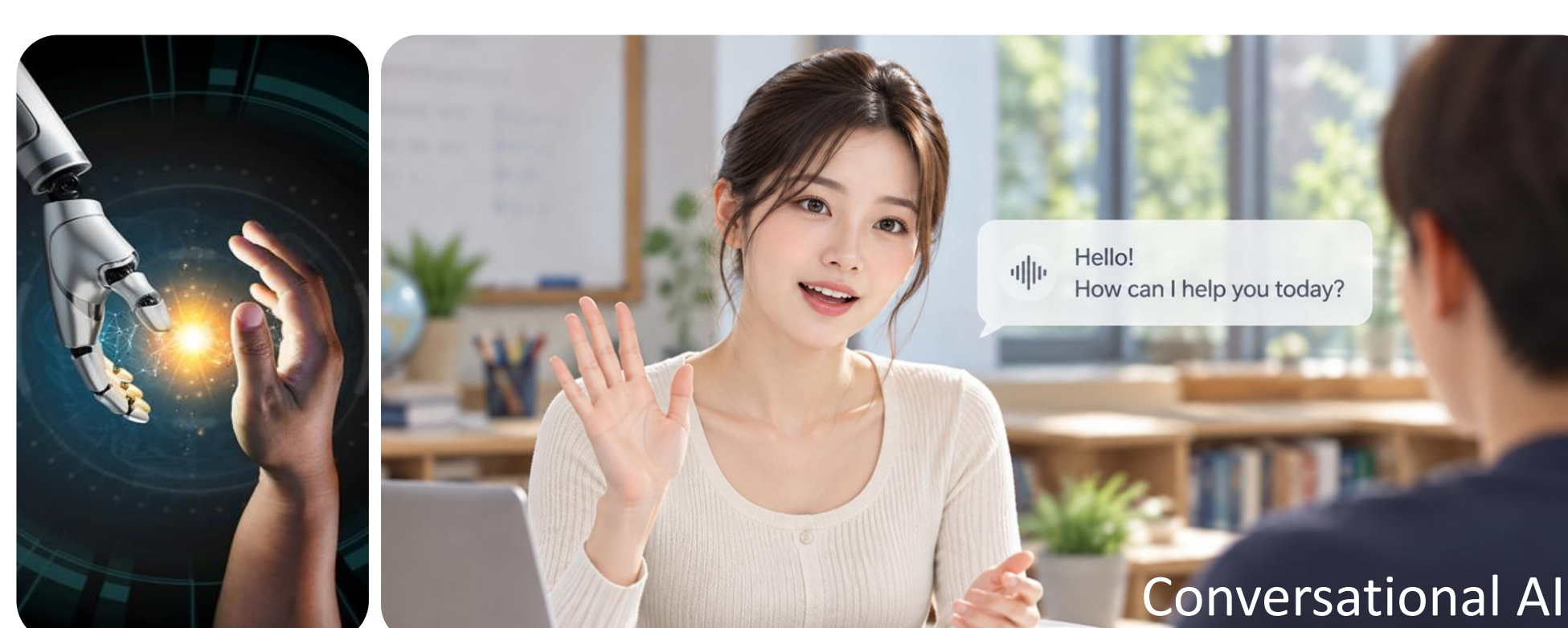
Language, voice, facial expression, gaze, gesture, behavior and social context understanding



- Speech-Driven 3D Facial Animation & Articulatory Modeling
- Multimodal Understanding (Language, Audio, Vision, Gestures)
- Vision-Language & Audio-Language Reasoning
- Human Behavior Understanding & Modeling

3 Physical Intelligence & Interactive Systems

Embodied agents, XR/robotics interface, and intelligent human-machine interaction systems



- Human-Robot Interaction & Physical AI
- Conversational AI & Virtual Avatars
- Real-to-Sim-to-Real Human Motion Imitation
- Multimodal Understanding of Egocentric Interactions

RESEARCH PROJECTS

과제명 소리 내고 온몸으로 경험하는 체험형 도서관 기술 개발

• 연구기간 2026 - 2028
• 지원기관 한국콘텐츠진흥원

과제명 감성 AI 기반 글로벌 문화콘텐츠 스토리텔링과 이미지 생성 연구

• 연구기간 2025 - 2031
• 지원기관 한국연구재단

과제명 가상융합대학원(중앙대학원)

• 연구기간 2024 - 2029
• 지원기관 정보통신기획평가원

과제명 생성형 AI 및 클라우드 기반 콘텐츠 제작 R&D 인재 양성

• 연구기간 2024 - 2026
• 지원기관 한국콘텐츠진흥원

협력기관

KAIST, ETRI, 국방과학연구소, UCLA ARTISCI, EPFL, CityU

AWARDS

Year	Organization	Awards
2026	AISP of IEIE	Outstanding Young Researcher (Prof. Hak Gu Kim)
2026	Chung-Ang Univ.	26-1 Outstanding Course Evaluations (Prof. Hak Gu Kim)
2026	IEIE Summer Conference	Best Student Award (MS Student. Seungjae Lee)
2025	Chung-Ang Univ.	24-2 Outstanding Course Evaluations (Prof. Hak Gu Kim)
2025	IPIU	Best Paper Award (PhD Student. Hyung Kyu Kim)

SELECTED PUBLICATIONS

Year	Journal/Conf	Paper Title	Highlight
2026	IEEE TIP	Language-Guided Scene Text Segmentation via Hierarchical Text Context Reasoning and Implicit Glyph Refinement	JCR Top 2.2%
2026	NeurIPS	Seeing Speech: Learning Visible Articulatory Dynamics for Speech-Driven 3D Facial Animation	Top-tier Conference
2026	IEEE TIFS	Deformable 3D Point Cloud Perturbations using Cage-based Deformation for Semantic Consistency	JCR Top 7.8%
2026	Interspeech	ArtBoost: Synthetic Articulatory Data Augmentation for Acoustic-to-Articulatory Inversion	Top-tier Conference
2025	ICCV	MemoryTalker: Personalized Speech-Driven 3D Facial Animation via Audio-Guided Stylization	Top-tier Conference
2025	Interspeech	Learning Phonetic Context-Dependent Viseme for Enhancing Speech-Driven 3D Facial Animation	Top-tier Conference
2024	CVPR	Causal Mode Multiplexer: A Novel Framework for Unbiased Multispectral Pedestrian Detection	Top-tier Conference