Special Topics in Smart Convergence : AI for Smart Life

Fall 2021, KAIST

The goal of this course is for students to learn how to design and build an AI service that makes our life smarter. To this end, students will learn a variety of topics including basic concepts of AI and Human-Computer Interaction, design process and prototyping techniques, transparency and explainability of AI systems, and socio-ethical issues. The course consists of a variety of participatory activities (e.g., take-home/in-class activities, team lectures, tutorials, and group projects) led by three professors from School of Computing, Dept. of Industrial Design, and the Graduate School of Culture Technology.

Course No.	CoE491 (Section A)
Instructors	Juho Kim (School of Computing) juhokim@kaist.ac.kr Tak Yeon Lee (Dept. of Industrial Design) takyeonlee@kaist.ac.kr Young Yim Doh (Graduate School of Culture Technology) yydoh@kaist.ac.kr
Class Time	4-7pm Tuesdays
Classroom	N1-110 + Live Zoom session (Note this is a hybrid course that will have both in-person and remote components. For some sessions physical attendance will be required.)
L:L:C	3:0:3
Grading	S,U
Course Level	Common (Bachelor / Master / Doctorate allowed)
Course Type	Major Elective (Recognized as major credit for “individually designed major” students. Many departments will recognize as “major elective”: Contact course staff for details.)
Course Website	https://star.kaist.ac.kr/
Evaluation Criteria	Team Project: 50% Assignments: 30% Participation: 20% No exams

Tentative Schedule

Week	Topic In-class Activity and Discussion	Tutorial Group Project
1	**Introduction to the course** - What AI-infused systems are - Sharing students' interest and expectations	
2	**Case studies of AI-infused systems** - Chatbots, Recommender systems, Games, etc. - An Anatomy of AI service design	
3	**Primer on Psychology** - Human Motivation, Behavioral changes, etc.	- Supervised / Unsupervised ML; Building simple ML models - Individual Idea Pitch (service concept; target user; motivation)
4	**Primer on Service Design / User-Centered Design**	- Classifier / Regression model / Generator; Building web applications - Team Building
5	**Primer on Human-Computer Interaction & Human-AI Interaction**	- Why and when to use small / big models; Building a simple chatbot - Problem Definition
6	**Design process Part 1. Planning** - Planning; Stakeholders; Goal definition; Use-cases	- Dimension Reduction; Building a dashboard - Ideation
7	N/A	- Pitch presentation & Feedback session
8	No class (Midterm week)	

9	**Design process Part 2. Data** Data Ecosystem; Ethical issues of data collection; Crowdsourcing and Human-in-the-loop systems	- Data planning, collection, and processing
10	**Design process Part 3. Model** Model-selection, AutoML; Model as a blackbox / Model cards	- Metrics and rationales for model selection
11	**Design process Part 4. Interaction** Interaction; Prototyping strategy; Low to high-fidelity prototyping	- Interaction design
12	**Design process Part 5. Evaluation & Improvement** Evaluation of model, UI, and service; A/B testing; Importance of continuous monitoring and iterative improvements; Value-sensitive design and socio-ethical issues	- Usability testing & Iterative Planning
13	**Responsible AI** Explainability, Bias and Privacy issues Negative impacts of technology; Social responsibility of AI	- Iteration 1
14	**Human-AI Collaboration** Levels of initiatives and control; Building a mutual understanding and trust between human and AI	- Iteration 2
15	N/A	- Final presentation & Feedback session
16	No class (Final exam week)	