

## Cross-cultural Engineering Project (Innovation creation)

Date	Place	Partner Organization	Students' Major and Grade	Participants' Information	SIT Instructor
2025/07/19 ~2025/07/31	Portugal	Universidade do Minho King Mongkut's University of Technology Thonburi	<ul style="list-style-type: none"> <li>•Department of Machinery and Control Systems,</li> <li>Department of Planning, Architecture and Environmental Systems,</li> <li>Systems Engineering and Science</li> <li>•Undergraduate 4th grade, Master 1st grade</li> </ul>	(SIT) Students 20, Student Staff 3, Professor 3 (Universidade do Minho) Students 15, Student Staff 3, Professor 4 (King Mongkut's University of Technology Thonburi) Students 2	HASEGAWA Hiroshi(), WATANABE Dai(), MOCHINAGA Dai()



Image1 Group photo at Uminho

Thinking in Engineering (Systems Engineering) educational program as a core course for undergraduate and graduate majors. The culmination of this educational program is the Cross-cultural Engineering Project (CEP), which is implemented in Japan, Southeast Asia, and Europe. The Japan region is held at the Omiya Campus of SIT, where participants from various countries and fields deal with issues related to industry-academia-region collaboration. The Southeast Asia region is held in Bangkok, Thailand, and targets global issues. The European region will be held in Portugal, and will focus on innovation creation. Participants can earn credits by taking courses in any of these three regions. CEP@UMinho was held at Universidade do Minho in Braga, Portugal from July 21 to 29. The number of participants was 37 students from Portugal, Thailand and Japan, in 6 groups. CEP@UMinho is a PBL on the issue of innovation creation, and value creation was conducted based on the thinking process of Creative and Inventive Design Support System (CDSS) with Generative AIs. First, in the Problem-Understanding process, Empathy Map by Public Narrative (Story of self & us) and Inspiring stories by scenario graph were derived as Strategy Responses Objectives, needs, and solutions were organized and analyzed using the QFD matrix (quality requirements and solutions). In the Problem-Solving process, top-down thinking by particle method, contradiction resolution by TRIZ, and bottom-up thinking using UML were applied to derive a solution to the problem from the QFD matrix. Moreover, Generative AI based on each thinking process were applied. The problem solutions were reviewed to Design Review (DR) by professors from UMinho and SIT, using A3 materials. Based on the results of the DR, the proposal was redefined and revised, business models were created, and a final presentation was performed. In the final presentation, a Q&A session was held with the participants and professors. As a result, the 1st place project, "UX and Innovation about SDGs," was awarded to the free theme group, and the 2nd place project, "CHRONO: MY", a project of a cooperative company, achieved excellent results.



Image2 University of Minho, Braga, Porto


 Image3 Ice-breaking activities and project work  
 Image4 2nd place project team work


Image5 View to Ponte de Lima