DC7: AI-enabled agile communication for remote haptic interaction in Tactile Internet

Application deadline: 28-02-2023 | Date of enrolment: 1-9-2023

Project description

With the advancement of AI, it is possible to use AI techniques to predict the next movement of human and machine in real time for a given operation, particularly in repetitive or constrained environments. Accurate motion prediction can interpolate and extrapolate human and machine motions for reducing perceived E2E latency, even reducing the demand on E2E communication resources. Motion prediction is promising to address the instability in remote haptic interactions, thereby providing graceful service degradation in critical communication conditions.

This project aims to apply Deep Learning models to accurately predict human and robot motions in real-time using time-series data, thereby enabling dynamic network service provisioning in Tactile Internet. The project will identify the interactions between the Tactile Internet service and the network to enable dynamic adaptation and reconfiguration of the E2E service provisioning. This project will analyse the effect of missing data from single or multiple modalities due to packet loss or communication outage in the performance of the predictions and propose ways to increase robustness. The project will also study how to reduce the update rate of video and haptic control signals with motion prediction, while guaranteeing the user Quality of Experience and Quality of Task.

Eligibility Conditions

- Master's degree in Computer Engineering, Electrical Engineering, Telecommunications, Computer Science, or within a relevant area.
- The candidates are eligible if they have not resided in Denmark for more than 12 months within the past 36 months.

Required Skills

- Background on machine learning and wireless communication system is desired.
- Strong analytical skills, optimization techniques and programming skills are desired.
- Experience in haptic technology and haptic application is a plus.
- Excellent English verbal and written skills.
- Be able to work well and communicate expert knowledge in an interdisciplinary team.

How to apply

Contact details: Qi Zhang qz@ece.au.dk and Alexandros Iosifidis ai@ece.au.dk

Please submit your application via the online application system here.

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