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Department of Mechanical Engineering

Acceptable course(s)

➢ Master's Degree

➢ Doctoral Degree

Research Topics

The main topics of research are the elemental technologies of intelligent mobilities, such as recognition systems of surrounding driving environment, digital maps systems, motion control systems, and their integrations. Following are a few research topics.

1. Adaptive motion control based on data-driven risk map

To prevent traffic accidents on community roads, we developed proactive braking intervention systems. Further, to make such systems more adaptive, we developed a new algorithm for the evaluations of risk around non-signalized intersections with poor visibility, and an adaptive motion control algorithm based on such data-driven risk map [1].

2. Recognition systems of surrounding driving environments on community roads

To realize advanced driver assistance systems on community roads, we developed various recognition systems of surrounding driving environments where various road marks are damaged and lane marks does not exist, by combining the information from onboard sensors with the information from digital maps [2].

3. Interactive motion control systems considering surrounding traffic participants

To make autonomous locomotion of personal mobilities more harmonious with surroundings on pedestrian spaces, we developed interactive motion control systems based on the recognition of travel modes of surrounding traffic participants [3].

Articles Related to Research Topics

[1] Ito, T. et al., Evaluation of Acceptability of Adaptive Proactive Braking Intervention System Based on Risk Map for Elderly Drivers, Int. J. of Automotive Eng., 11(2), pp. 40-48, 2020. [DOI: 10.20485/jsaeijae.11.2_40]

[2] Furuse, W. et al., Lateral Localization via LIDAR-Based Road Boundary Extraction on Community Roads, Int. J. of Automotive Eng., 11(3), pp. 116-123, 2020. [DOI: 10.20485/jsaeijae.11.3_116]

[3] Ito, T. et al., Interactive Collision Avoidance Based on Surrounding Mobility Type for an Intelligent Powered Wheelchair, Int. J. of Adv. Robotic Sys.,10(5), pp. 1-11, 2013. [DOI: 10.5772/56450]

Lab. Web page: https://sites.google.com/g.ecc.u-tokyo.ac.jp/iml/