Institute for Neural Computation

Location: San Diego Supercomputer Center, East Annex South Wing, Level B1, EB-129
Date/Time: Thursday – November 5, 12:30-1:30pm

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BEYOND STEERING IN HUMAN-CENTERED CLOSED-LOOP CONTROL

Abstract: Machines provide us with the capacity to achieve goals beyond our physical limitations. For example, automobiles and aircraft extend our physical mobility, allowing us to travel vast distances far ahead of the time it would take us otherwise. It is truly remarkable that our natural perceptual and motor capabilities are able to adapt, with sufficient training, to the unnatural demands posed by vehicle handling. While much progress has been achieved in formalizing the control relationship between the human operator and the controlled vehicle, considerably less is understood with regards to how human cognition influences this control relationship. Such an understanding is particularly important in the prevalence of autonomous vehicular control, which stands to radically modify the responsibility of the human operator from one of control to supervision. In this talk, I will first explain how the limitations of a classical cybernetics approach can reveal the necessity of understanding high-level cognition during control, such as anticipation and expertise. Next, I will present our research that relies on unobtrusive measurement techniques (i.e., gaze-tracking, EEG/ERP) to understand how human operators seek out and process relevant information whilst steering. Examples from my lab will be used to demonstrate of how such findings can effectively contribute to the development of human-centered technology in the steering domain, such as with the use of warning cues and shared control. Finally, I will briefly present some efforts in modeling an augmented aerial vehicle (e.g., civil helicopters), with the goal of making flying a rotorcraft as easy as driving (www.mycopter.eu).

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