

nformatik-Kolloquium

Der Fachbereich Informatik der Johannes Kepler Universität Linz¹ lädt in Zusammenarbeit mit der Österreichischen Gesellschaft für Informatik (ÖGI) zu folgendem Vortrag ein:

Dr. Andrew Straw, IMP Wien

Combining Virtual Reality and Genetics to Understand the Fruit Fly Brain

Mi, 12. 1. 2011, 17.15 Uhr
Johannes Kepler Universität Linz, Raum MT124

Abstract:

A fundamental question in neuroscience is how simultaneous, distributed activity across the nervous system orchestrates animal-environment interaction to produce adaptive behavior. The visual system of the fly has been intensively studied for six decades from computational, behavioral, physiological, developmental, genetic, and optical perspectives and is perhaps the best understood system of any brain. Despite this wealth of knowledge, our understanding of the behavioral capabilities of flies, and consequently how this well-studied part of the nervous system is involved in these tasks, remains rudimentary. To address this limitation, I and my colleagues have developed a realtime computer vision system for tracking freely flying flies. Combined with a virtual reality system built on computer games technology, we are using this automated system to ask how the fly perceives its world and structures its movement through it. In this talk, I will describe a recent study using this apparatus in which we discovered that fruit flies use nearby horizontal edges for regulating their altitude. We are now extending this system to investigate high level visual behavior in flies. Furthermore, by utilizing modern molecular genetic techniques, we can inactivate small sets of neurons in the fly brain, and by correlating these manipulations with behavioral deficits measured using the VR system, we can establish a correspondence between particular brain circuits and their role in behavior.

¹ Der Fachbereich (<http://informatik.jku.at>) besteht aus folgenden Instituten:

Anwendungsorientierte Wissensverarbeitung (FAW), Bioinformatik, Computational Perception, Computergrafik, Computer-Architektur, Formale Modelle und Verifikation, Informationsverarbeitung und Mikroprozessortechnik (FIM), Integrierte Schaltungen, „integriert studieren“, Pervasive Computing, Systemsoftware, Systems Engineering und Automation, Telekooperation

About the Speaker:

Andrew Straw received his Ph.D. in Physiology in 2004 from the University of Adelaide, Australia studying motion vision in the hoverfly using electrophysiological approaches. He then moved to the California Institute of Technology where he was a postdoc and then senior research fellow, and studied visually guided flight behavior of the fruit fly. In November, 2010 he began his own laboratory at the Research Institute of Molecular Pathology (IMP), Vienna, where he is combining realtime fly tracking and visual stimulus generation with modern molecular genetic tools to elucidate the function and structure of the fly brain.

*Univ. Prof. Dr. Oliver Bimber
Institut für Computergrafik*

¹ Der Fachbereich (<http://informatik.jku.at>) besteht aus folgenden Instituten: Anwendungsorientierte Wissensverarbeitung (FAW), Bioinformatik, Computational Perception, Computergrafik, Computer-Architektur, Formale Modelle und Verifikation, Informationsverarbeitung und Mikroprozessortechnik (FIM), Integrierte Schaltungen, „integriert studieren“, Pervasive Computing, Systemsoftware, Systems Engineering und Automation, Telekooperation