Ilyas Kuhlemann

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Education

Georg-August-University Göttingen

Master *10/2013– approx. 12/2015*

Biophysics and complex systems, with special interest in computational ceuroscience, network dynamics and robotics.

Georg-August-University Göttingen

Bachelor *10/2009–09/2013*

Physics

Gymnasium Leopoldinum Detmold

Abitur (A-levels) *08/1999–06/2008*

Intensive courses in mathematics and physics.

Master's thesis

Title: working title: *A cellular model of gain control in insect motion vision.*

Supervisors: Dr. Bart Geurten, Prof. Dr. Florentin Wörgötter

My work: The role of most neurons in the fruit fly *drosophila malanogaster*'s optic lobe is unknown. Models of *drosophila*'s motion detector are usually immensely simplified. I developed a Python module for building neural circuits in insects' compound eyes on a cellular level. These circuits are easy to modify and extend by additional neurons, allowing for investigation of neurons whose roles are yet to be figured out. With this module I want to investigate possible candidates for gain control in the motion vision circuit.

Bachelor's thesis

Title: *Analysing a dynamic walker's gait stability with compliant and rigid ankles, Note: 1,0*

Supervisors: Prof. Dr. Florentin Wörgötter, Dr. Poramate Manoonpong

My work: The very energy efficient bipedal *dynamic walkers*, which are inspired by human walking, used curved feed rigidly attached to their legs. This design aided their forward movement by allowing the robot's body to roll forward while standing on its foot. A more recent design swaps curved for flat feet, that are attached with a passive ankle joint (spiral spring) to the legs. The spring, too, aids the robot in its forward movement, while the flat foot provides more stability than the curved one. To compare both designs directly, I adapted the newer one for our department's dynamic walker 'RunBot' and conducted experiments comparing overall stability.

Experience

Third Institute of Physics, Georg-August-University **Göttingen**
Student assistant *04/2014–06/2014*
Control of the dynamic walker 'RunBot' via PC and a data acquisition unit did not provide any free channels to add more actuators or sensors to the robot. My tasks involved to port the controller to a Raspberry Pi, control all present actuators and sensors and allow for easy extension by more sensors. I chose a combination of Raspberry Pi and Arduino (I^2C) to achieve that. Furthermore, the project had to be documented in a good way, such that a group of researchers at the university in Odense, Denmark, would be able to take my set-up to control their copy of RunBot. I supervised two master students of their group for one week in Göttingen and introduced them to my work.

Max Planck Institute for Dynamics and Self-organization **Göttingen**
Student assistant *05/2011–04/2012*
Programming of a data analysis tool in python. The data that were to be analysed were neuronal recordings from a multi-electrode array of 60 electrodes. To read the data a C module was adapted and implemented using the *Python/C Application Programmer's Interface*. The tool extracted statistical properties from the data and showed important features in plots.

Internships

Intelligent Systems Laboratory, Yıldız Teknik University **Istanbul**
IAESTE internship *06/2013–07/2013*
Reading and processing of information from network packages, for further use in classification by machine learning programmes.

Voluntary work

Nachbarschaftszentrum Grone **Göttingen**
Aid in homework *03/2011–09/2011*
Aiding pupils with migration background in their homework.

Languages

German: native
English: fluent
Turkish: basics
Arabic: basics

IT

Operating systems: Linux, Windows
Programming: C/C++, Python
Mathematics: MatLab, NumPy
Typesetting: LaTeX
Office: LibreOffice
Graphics: Inkscape

Publications

I. Kuhlemann, J.-M. Braun, F. Wörgötter, and P. Manoonpong. Comparing arc-shaped feet and rigid ankles with flat feet and compliant ankles for a dynamic walker. In *Mobile Service Robotics*, number 17 in Proceedings of the International Conference on Climbing and Walking Robots, page 353, 2014.