ipal
Image & Pervasive Access Lab

Bio-inspired Vision for Mobile Robotics

Supervisor
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Presentation of the project

The aim of this internship is to be inspired by biological systems to induce realistic camera movements on a robotic platform. Indeed, complex eye strategies are at work during the observation and navigation in animals and humans [1,2]. These strategies can be transferred in the context of observation and navigation for a robotic platform. On the technical aspects, the candidate will use FPGA technology equipped with inertial sensors, actuators and a camera. After a literature review, much of the work will consist of signal and image processing in VHDL (or Verilog) and in the design of an electronic card. This internship can lead to a PhD.

Expected deliverables

This internship will lead to the design of a prototype of a vision robotic system. Another important deliverable will be the code associated to the hardware. Finally, the last important required deliverable is the report that has to be written in English.

Keywords

FPGA, electronics, bio-inspired systems, camera, inertial sensors, actuators.

Applicant profile

- Master Degree or Engineer Student (last year of studies).
- Skills in programming: required VHDL and/or VERILOG.
- Skills in electronics: Knowledge on Eagle, Proteus, Orcad or similar software would be appreciated.
- Knowledge in Signal and Image Processing.
- Strong motivation towards this challenging project.
- Availability for 5 to 6 months starting in the first semester of 2015.

Gratification: About 800€ net per month

References

[1] S. Hillaire, G. Breton, **N. Ouarti**, R. Cozot, and A. Lecuyer. Using visual attention models and saliency maps to improve gaze tracking in interactive 3d application. Computer Graphic Forum, 0:1–8, 2010.

[2] M. Wexler and **N. Ouarti**. Depth affects where we look. Current Biology, 18(23):1872–6, 2008.

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