

Robbrecht Pelgrims

neuroscience PhD student and electronics engineer

+ CONTACT

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Nationality Belgian

+ EXPERIENCES

PhD student **Studying learning-induced changes to the cortico-limbic circuitry of juvenile zebrafish.**

Kavli Institute for Systems
Neuroscience/Centre for
Neural Computation

Using the previously developed virtual reality system to image the brain of zebrafish navigating in a virtual space, while submitted to an avoidance conditioning protocol. Plenty of data analysis in MATLAB.

A moderate amount of teaching (NTNU course NEVR3002).

Research assistant **Developing a multi-sensory virtual reality system for zebrafish.**

Kavli Institute for Systems
Neuroscience/Centre for
Neural Computation

Development of a closed-loop virtual reality environment for zebrafish, allowing simultaneous 2-photon brain imaging and behavioral analysis. Building software (C/C++, Qt) and hardware for acquiring images and controlling pumps, speakers, LEDs, vibration engines, valves, an electro-stimulator, and a projector in an automated fashion.

Master's thesis student **Building and implementation of a real-time functional imaging platform for closed-loop optogenetic control of neural activity.**

Neuro-Electronics
Research Flanders

Building a low-cost microscope for Ca-imaging, developing a high-speed camera controller and a real-time GPU-based image segmentation and analysis program (C++/CUDA), with the goal of measuring neural activity and manipulating it by optical stimulation. Development of a PCB for the electrical/optical stimulation/recording, controlled by a PIC18LF45K50.

Project manager **UBIsnake: using smartphones as controller for multiplayer online gaming.**

UBIsnake – university of
Oulu

Creation of a new game for the UBLOULU infrastructure, a collection of large interactive public displays in the city of Oulu, Finland. Studying interaction of persons with the system. In this project, I developed a smartphone GUI, and implemented its communication with a (Python-based) central server.

Design engineer **Implementation of a wireless system for detection of bike theft.**

Project WMB – KULeuven

Developing a bike tracker for the government subsidized organization "Where's My Bike", with the goal of reducing bike theft in the region of Leuven. In this project, I implemented the communication of the tracker with the cell phone network, and designed the first PCB prototype (with a PIC18F26K22 microcontroller, a SIM900 GSM module, and a u-blox NEO GPS module).

Design engineer **Development of an intelligent gomoku robot.**

Group T

Developing a robot that is able to solve a gomoku game, competing against a human. In this project, I implemented the main algorithm behind the system (threat-space search) in LabView.

+ PUBLICATIONS

- 06/2018 **Information processing in the vertebrate habenula.**
Fore et al. (Seminars in Cell and Developmental Biology)
- 01/2017 **Motile-cilia-mediated flow improves sensitivity and temporal resolution of olfactory computations.**
Reiten et al. (Current Biology)

+ EDUCATION

- 09/2013 – 01/2015 **Master of Science, Industrial Sciences: Electronics Engineering**
(graduated with ECTS grade A)



Relevant courses include: programmable logic, embedded system design, wireless communication, power electronics

- 09/2013 – 12/2013 **Master of Science, Electronics Engineering**
(Erasmus exchange)



Relevant courses include: ubiquitous computing fundamentals, digital image processing, digital video processing

- 09/2010 – 06/2013 **Bachelor of Science, Industrial Sciences: Electronics Engineering**



Relevant courses include: digital signal processing, analog electronics, microcontrollers, electronic design

+ CERTIFICATES

- 03/2015 **Laboratory Animal Science (FELASA C)**



A one-week course discussing the use of animals in scientific experiments, leading to a FELASA C certificate.

- 07/2014 **Advanced Behaviour Technology**



A one-week summer course introducing the fundamental techniques of "behavior for neuroscientists". Keywords: electronics, video processing, animal training, closed-loop control, VR.

- 03/2014 **Computational Neuroscience**



An 8-week online course focusing on computational techniques for analyzing and modeling the behavior of neurons and networks comprised of them.

+ SKILLS

- Research related **Microscopy** (single- or two-photon) **and general optics, zebrafish care, optogenetic manipulation, animal conditioning**
- Programming languages **Assembler, C, C++** (including multi-threaded applications), **Java, Python, MATLAB, VHDL, LabView**
- Natural languages **Dutch** (mother tongue), **English** (fluent), **French** (basic), **Norwegian** (A1 level)
- Hardware **Embedded systems, FPGA** (limited), **PCB design**