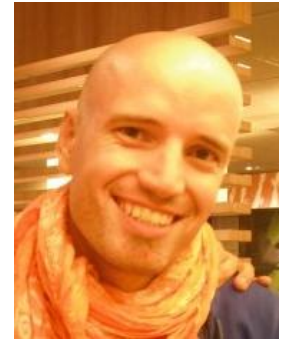


# Brice REBSAMEN



## Associate Scientist

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## Education

### Jan 04:

Started a PhD at the National University of Singapore. Subject: Development of a Brain Controlled Wheelchair. Thesis submitted Nov 2008.

Took classes in real time systems, evolutionary computation, human robotics, neural networks, uncertainty modelling in AI, neurosciences.

### Sept 02 - June 03:

Master degree in cognitive sciences (INPG, Grenoble, France): artificial intelligence (neural networks, genetic algorithms, expert systems, probabilistic reasoning), cognitive psychology, linguistic, physiology (detailed study of the retina and the visual cortex), neurology, cytology.

### Sept 99 - June 02:

Master degree of electronic engineering at ENSEIRB (National school of electronics, Bordeaux, France), specialty radio communications.

digital and analog electronics, HF and micro-wave circuits, communication technologies: optical fibers, networks, GSM, hertzian beams, quantum physics and electromagnetic waves physics, electromagnetic compatibility, programming languages (C, C++, assembly, VHDL).

### Sept 97 - June 99:

A two years advanced mathematics course in preparation for the selective entrance examination to the french engineering schools at *école des pupilles de l'air* (Grenoble, France).

### From the age of 12:

I taught myself programming: Basic, C, HTML, java, PHP, C#, C++ and experimented with many other languages for fun.

## Professional Experience

### Since July 09:

Associate Scientist at the Cognitive Sciences Laboratory at Temasek Lab. I am working on a system to evaluate the cognitive load in real time from EEG and fNIRS recording. The long term goal is to prevent errors and increase performances by adaptively modulating the task complexity according to the operator's cognitive capacity.

### Jan 08 - July 09:

Research Fellow at the Social Robotics Lab (NUS/IDMI) for team X-1 for Singapore's TechX Grand Challenge. We developed an autonomous robot able to navigate, climb stairs and take the elevator. My main contributions to the team are:

- Designed a concurrent and modular software architecture that works under Linux and QNX. Coded from scratch in C++.
- Designed the hardware abstraction layer, and wrote the corresponding drivers.
- Interfaced with USARSim, a robotic simulator based on the game Unreal

Tournament, and with the Packbot robot.

- Development of various tools for the other programmers: utility classes, advanced data structures (trees and graphs), visualization, remote monitoring, data logging...
- Ensure code sanity: this includes teaching good programming practices and debugging others' code.

#### **Jan 04 - Dec 07:**

PhD project at NUS.

- Conception of a collaborative control strategy to reduce maneuvering efforts by following ergonomic guiding paths (collaboration with LIMS lab, Northwestern University, Chicago).
- Implementation of the control software under Linux RTAI
- Development of a Brain-Machine Interface (collaboration with the Neurosignal processing lab at I2R/A\*STAR, Singapore) to control in real time the wheelchair.

#### **March 03 - June 02:**

Research at INRIA

Movement detection with a laser telemeter using statistical learning and probabilistic reasoning (Hidden Markov Models).

#### **March 02 - Aug 02:**

Research internship at Bradford university, England

Electromagnetic propagation in human head close to a mobile phone antenna using finite-difference time-domain method. Application to the design of shielding methods to reduce absorption.

#### **July 01 - Nov 01:**

Industrial internship at Formes et performances, Bordeaux, France.

I designed a self calibrating 1 MHz ultrasound generator for medical therapy.

#### **1999 - 2004:**

Tuition classes in mathematics and physics.

## **Publications**

### **Journal Articles**

- B. Rebsamen, E. Burdet, C. Guan, H. Zhang, C.L. Teo, Q. Zeng, M. Ang and C. Laugier, *Controlling a Wheelchair Indoors using Thought*, IEEE Intelligent Systems, March/April 2007.
- Q. Zeng, C.L. Teo, B. Rebsamen, and E. Burdet, *A Collaborative Wheelchair System*, IEEE Trans. on Neural Systems and Rehabilitation, Vol. 16, No. 2, 2008.
- Q. Zeng, E. Burdet, B. Rebsamen, and C.L. Teo, *Collaborative Path Planning for a Robotic Wheelchair*, Disability and Rehabilitation: Assistive Technology, 2008

### **Conference Articles**

- B. Rebsamen, E. Burdet, C. Guan, H. Zhang, C.L. Teo, Q. Zeng, M. Ang and C. Laugier, *Controlling a wheelchair using a BCI with low information transfer rate*, IEEE Int. Conf. on Rehabilitation Robotics (ICORR), 2007
- Q. Zeng, C.L. Teo, B. Rebsamen, and E. Burdet, *Evaluation of the Collaborative Wheelchair Assistant System*, in IEEE Int. Conf. on Rehabilitation Robotics (ICORR), 2007.
- Q. Zeng, E. Burdet, B. Rebsamen, and C.L. Teo, *Experiments on Collaborative Learning with a Robotic Wheelchair*, in Int. Convention for Rehabilitation Engineering and Assistive Technology (i-CREATE), 2007.
- B. Rebsamen, E. Burdet, C. Guan, H. Zhang, C.L. Teo, Q. Zeng, M. Ang and C. Laugier, *A Brain-Controlled Wheelchair Based on P300 and Path Guidance*, IEEE Int. Conf. on Biomedical Robotics and Biomechatronics (BioRob), 2006.
- Q. Zeng, B. Rebsamen, E. Burdet and C.L. Teo, *Design of a Collaborative Wheelchair with Path Guidance Assistance*, IEEE Int. Conf. on Robotics and Automation (ICRA), 2006.
- B. Long, B. Rebsamen, E. Burdet and T.C. Leong, *Development of an elastic path controller*, IEEE Int. Conf. on Robotics and Automation (ICRA), 2006, pp 493-498.
- B. Long, B. Rebsamen, E. Burdet, T.C. Leong and H.Y. Yu, *Elastic Path Controller for Assistive Devices*, Proc. 27th Int. Conf. of IEEE-EMBS, 2005.