Quentin Rouxel | PhD

Apt 387, Hameau de Noailles, rue du Haut Carré
33400 Talence – France
+33 6.99.60.28.40
leph.quentinrouxel@gmail.com • 28 year old, French

Personal webpage : **http://www.labri.fr/perso/qrouxel**
Available from January 2018.

Research Project

Dynamic motion generation (walk, kick) on flawed humanoid robots. Overcome faults (mechanical, electrical, control) using machine learning. Simulation, identification and learning of dynamics.

Education

- **Bordeaux University** — **Bordeaux**
  PhD in Robotics under the supervivion of Olivier Ly — *2013–2017*
  LaBRI. Rhoban Team.
- **Enseirb-Matmeca** — **Bordeaux**
  Engineering degree in computer science — *2010–2013*
- **Lycée Saint Louis** — **Paris**
  Preparatory classes for the Grandes Écoles — *2007–2010*
  A two year intensive Maths and Physics course in preparation for the selective entrance examination to French engineering schools.

Publication

- Ludovic Hofer and Quentin Rouxel. An operational method toward efficient walk control policies for humanoid robots. In *International Conference on Automated Planning and Scheduling (ICAPS) 2017*, accepted
- Julien Allali, Louis Deguillaume, Rémi Fabre, Loic Gondry, Ludovic Hofer, Olivier Ly, Steve N'Guyen, Grégoire Passault, Antoine Pirrone, and Quentin Rouxel. Rhoban football club : Robocup humanoid kid-size 2016 champion team paper. In *RoboCup 2016 : Robot Soccer World Cup XX*. Springer, 2016
- Rémi Fabre, Quentin Rouxel, Grégoire Passault, Steve N'Guyen, and Olivier Ly. Dynaban, an open-source alternative firmware for dynamixel servo-motors. In *Symposium RoboCup 2016 : Robot World Cup XX*, 2016
- Quentin Rouxel, Gregoire Passault, Ludovic Hofer, Steve N'Guyen, and Olivier Ly. Learning the odometry on a small humanoid robot. In *Robotics and Automation (ICRA), 2016 IEEE International Conference on*. IEEE, 2016
- Quentin Rouxel, Grégoire Passault, Ludovic Hofer, Steve N'Guyen, and Olivier Ly. Rhoban hardware and software open source contributions for robocup humanoids. In *Proceedings of 10th Workshop on Humanoid Soccer Robots, IEEE-RAS Int. Conference on Humanoid Robots, Seoul, Korea*, 2015
- Grégoire Passault, Quentin Rouxel, Ludovic Hofer, Steve N'Guyen, and Olivier Ly. Low-cost force sensors for small size humanoid robot. In *Humanoid Robots (Humanoids), 2015*

IEEE-RAS 15th International Conference on (Video Contribution), pages 1148–1148. IEEE, 2015

Teaching Experiences

- **Humanoid Robotics project supervision** — **10h, Master**
  Implement ZMP walk on humanoid robot (C++). LIPM. LQR controller. — *2016*
  Enseirb-Matmeca, Robotics department
- **Robotics and learning project supervision** — **10h, Master**
  Building wheeled and crawling robot. MDP Q-learning of movement. — *2016*
  Enseirb-Matmeca, Robotics department
- **C programming project supervision** — **26h, License**
  Tabletop game implementation in C — *2016*
  Enseirb-Matmeca, Computer Science department
- **Operating system project supervision** — **20h, Master**
  Thread library implementation in user space in C — *2016*
  Enseirb-Matmeca, Computer Science department
- **Operating system tutorial** — **20h, Master**
  Scheduler, virtual memory, syscalls, Linux kernel — *2016*
  Enseirb-Matmeca, Computer Science department
- **Development tools tutorial** — **24h, License**
  GDB/Valgrind, SVN/GIT, Doxygen, good practices — *2016*
  Enseirb-Matmeca, Computer Science department
- **C++ programming tutorial** — **12h, Master**
  C++ introduction exercises — *2016*
  Enseirb-Matmeca, Computer Science department
- **Assembly and embedded micro controller tutorial** — **15h, License**
  X86-64 Assembly, ARM embedded system programming in C — *2016*
  Enseirb-Matmeca, Computer Science department
- **Robotics project supervision** — **10h, Master**
  V-REP simulation environment for humanoid soccer — *2014*
  Enseirb-Matmeca, Robotics department
- **C programming project supervision** — **28h, License**
  Tabletop game and AI implementation in C — *2014*
  Enseirb-Matmeca, Computer Science department
- **Robotics initiation week tutorial** — **18h, Master**
  Embedded programming, Electronics, Computer vision, simple control — *2014*
  Enseirb-Matmeca, Robotics department
- **Compilation tutorial** — **14h, Master**
  Regular expression, formal grammar, lexical, syntax, semantic analysis — *2014*
  Enseirb-Matmeca, Computer Science department

Conference and Event Participation

Scientific Conference

- **ICRA** — **Stockholm, Sweden**
  IEEE International Conference on Robotics and Automation — *May 2016*
  Presentation of the paper "*Learning the Odometry on Small Humanoid Robot*"

- **RoHOW** — **Hamburg, Germany**
  Robotic Hamburg Open Workshop — *November 2015*
  RoboCup workshop with European community in humanoid leagues
- **JNRR** — **Cap Hornu, France**
  French National Robotics Research Days — *October 2015*
  French Robotics workshop. Poster presentation.

RoboCup Competition

Preparation and participation to the RoboCup international competition in Kid-Size Humanoid League
(Rhoban Football Club)

- **German Open 2017**, Magdebourg, Germany : *1st place*
- **RoboCup 2016**, Leipzig, Germany : *1st place*
- **RoboCup 2015**, Hefei, China : *3rd place*
- **RoboCup 2014**, João Pessoa, Brazil : *quater*
- **RoboCup 2013**, Eindhoven, Netherlands : *round robin*

Public Robotics Exhibition

- **Robot Maker's Day** — **Bordeaux**
  Local makers exhibitionJanuary 2015, June 2015, January 2016, June 2016, November 2016
  Presentation of Sigmaban and Metabot robots
- **Nuit de l'innovation** — **Bordeaux**
  Local technologies exhibition — *April 2016*
  Presentation of quadruped Metabot robots on evening
- **Rentrée solennelle de l'Université de Bordeaux** — **Bordeaux**
  Bordeaux university event — *October 2015*
  Technical presentation of soccer humanoid robots
- **Japan Expo** — **Paris**
  Japanese popular culture national exhibition — *July 2015*
  Two days presentation of Sigmaban and Metabot robots on Calliban robotic association stand
- **Bordeaux Geek Festival** — **Bordeaux**
  Geek and makers local exhibition — *May 2015*
  Four days presentation of Sigmaban and Metabot robots
- **Open Bidouille Camp** — **Bordeaux**
  Geek and makers local exhibition — *May 2015*
  Two days presentation of Sigmaban and Metabot robots
- **Boussoles du numérique** — **Bordeaux**
  Exhibition on education and digital technology — *December 2014*
  Presentation of Sigmaban and Metabot robots
- **Nuit du Web** — **Bordeaux**
  Local web and technologies exhibition — *October 2014*
  Presentation of Sigmaban and Metabot robots on evening
- **Innorobo** — **Lyon**
  International robotics exhibition — *March 2013*
  Presentation of the humanoid robot Acroban during 3 days

Technical Skills

- Linux/Unix environment

- Programming languages : C, C++ (modern C++ 11,14)
- Linux system administration
- Web development : HTML, CSS, PHP, Javascript.
  Framework : Silex, Doctrine, Symfony 2, JQuery.
- Vision processing with OpenCV.
- Database : MySQL, PostgreSQL.
- Graphical library : SDL, SFML, OpenGL.
- CAD : SolidWorks, OpenSCAD.
- Embedded systems : Arduino, AVR8, AVR32 architectures.
- Other tools : LaTeX, GIT, GnuPlot

Rhoban Team Involvement

RoboCup

High involvement in preparation and participation to the RoboCup Kid-Size Humanoid competition since 2013 with the *Rhoban Football Club* team.

Software Development

- **Rhoban Abstration Layer (RhAL) :** Low level communication library to Dynamixel motors and other devices (IMU, pressure sensors). Manage movements and low level synchronisation. Used by the robot's team since 2016.
  `https://github.com/Rhoban/RhAL`
- **Kinematic and Dynamics model :** Complete kinematic and dynamics model of the robots on top of RBDL library. Compute camera model and odometry model. Implement forward dynamics and contacts simulation.
  `https://github.com/RhobanProject/Model`
- **Rhoban Input Output Library (RhIO) :** User ncurses and terminal interface for robot monitoring, control and configuration. Used by all our robots since 2015.
  `https://github.com/Rhoban/RhIO`
- **Open loop walk engine :** Walk generator used by the Rhoban Team since 2014.
  `https://github.com/Rhoban/IKWalk`
- **Internal framework for RoboCup vision :** Some software engineering to structure our vision processing as filters and pipelines with OpenCV.
- **Euler-Lagrange 2d physic simulator :** Dynamic simulator for 2d passive walker. Use symbolic differentiation to compute Euler-Lagrange differential equation.
  `https://github.com/RhobanProject/SimLagrange`

Metabot Project

Involvement in the Metabot Project by Grégoire Passault (`http://www.metabot.fr/en/`) – a small quadruped robot for education. Supervision of students in robotics club (RoboCampus) from 2013 to 2015. Presentations in junior and high schools.