Miguel Campusano

Computer Engineering - Ph.D. Student   `http://mcamp.github.io`

STUDIES

2014 - Present   **Ph.D. in Computer Science**, *Computer Science Department*, Universidad de Chile, Web Page: http://www.dcc.uchile.cl/doctorado.

Thesis: Mapping State Machines to Developers' Mental Model: Fast Understanding of Robotic Behaviors in the Real World.

In this thesis I explore the concepts of meaningful feedback and live programming for robotic behaviors. I built two artifacts to validate both concepts: VizRob and LRP. I designed and conducted a case study for VizRob and a controlled experiment for LRP.

Expected date of graduation: March 2020

2007 - 2013   **Computer Engineering**, *Computer Science Department*, Universidad de Chile, Web Page: http://www.dcc.uchile.cl.

Thesis: The Friendly Aspect Language: Casper.

Casper is an aspect language for Pharo Smalltalk with a focus on speed at run-time.

RESEARCH

Visualizations of Robotic Behaviors.

I designed several visualizations to combine static and run-time information of robotic behaviors program within a debugging tool: VizRob. After a case study to get first impressions of VizRob, I am improving the tool and I am planning to validate it with a specialized experiment.

Live Programming in Robotic Behaviors.

I designed a live programming language to built robotic behaviors, Live Robot Programming (LRP). I conducted experiments to measure the impact of live programming in robotic behaviors development.

PUBLICATIONS

2019   **Live Programming in Practice: a Controlled Experiment on State Machines for Robotic Behaviors**.

Miguel Campusano, Johan Fabry, Alexandre Bergel
Information and Software Technology 108 (IST), 99-114, 2019 (Impact Factor: 2.921).

VizRob: Effective Visualizations to Debug Robotic Behaviors.

Miguel Campusano, Alexandre Bergel
Third IEEE International Conference on Robotic Computing (IRC), 86-93, 2019.

2017   **Live Robot Programming: The language, its implementation, and robot API independence**.

Miguel Campusano, Johan Fabry
Science of Computer Programming (SCP) 133, 1-19, 2017 (Impact Factor: 0.740).

2015   **From Robots to Humans: Visualizations for Robot Sensor Data**.

Miguel Campusano, Johan Fabry
IEEE 3rd Working Conference on Software Visualization (VISSOFT), 135-139, 2015.

2014   **Towards Live Programming in ROS with PhaROS and LRP**.

Pablo Estefó, Miguel Campusano, Luc Fabresse, Johan Fabry, Jannik Laval, Noury Bouraqadi
Fifth International Workshop on Domain-Specific Languages and Models for Robotic Systems (DSLRob), 2014.

Live Robot Programming.

Johan Fabry, Miguel Campusano

Ibero-American Conference on Artificial Intelligence (IBERAMIA), 445-456, 2014.

An Interpreter For Live Robot Programming.

Miguel Campusano, Johan Fabry

33rd International Conference of the Chilean Computer Science Society (JCC-SCCC), 2014.

Live Programming the Lego Mindstorms.

Johan Fabry, Miguel Campusano

6th International Workshop on Smalltalk Technologies (IWST), 2014.

Publications in Spanish

2017 **Aprendizaje Interdisciplinario en Robótica: La Innovadora Experiencia de Duckietown Chile**.

Interdisciplinary Learning in Robotics: The Novel Experience of Duckietown Chile

Matías Mattamala, Gonzalo Olave, Miguel Campusano, Cristopher Gómez, Luz Martínez, Pablo Estefó, Joakin Ugalde, Javier Urrutia, Felipe San Martín, Pablo Zúñiga, Javier Carrasco, Camila Villar, Rocío González

30th Congreso Chileno de Educación en Ingeniería, 2017.

2014 **Preparación para Competencia de Programación ACM-ICPC: Experiencia Inicial en Universidad de Chile 2011-2014**.

Training for ACM-ICPC Programming Competition: Initial Experience in the University of Chile 2011-2014

Miguel Campusano, Camilo Garrido, Jorge Pérez, Mauricio Quezada

XVI Encuentro Chileno de Educación Superior en Computación (CCESC), 2014.

Teaching Activities

2017 - 2019 **Teaching**, *Universidad de Chile*, Web Page: http://www.duckietown.cl.

I teach Project Workshop: Duckietown Chile, a self-driving vehicle class inspired by the MIT class 'Duckietown' (`http://duckietown.mit.edu/`)

2010 - 2016 **Teaching Assistant**, *Universidad de Chile*.

Teaching assistant in: Algorithms and Data Structures, Computer Architecture, Programming Languages, Programming Workshop, Project Workshop (Programming with Lego Mindstorm)

Organizational Experience

2016 - 2019 **Robotic Community**, *University of Chile*.

I am a founding member of the Robotic Community of the University of Chile. In this community we bring together all the students in the university that are interested in robotics. We organize a student seminar where students talk about their work in robotics.

2018 - 2019 **Beauchef Robotics Challenge**, *University of Chile*, GitHub: https://github.com/BeauchefRoboticsChallenge/.

I am a member of the organizing team of the line follower robot competition of the University of Chile: Beauchef Robotics Challenge.

2015 **Competitive Programming Training Camp**, *Valparaiso, Chile*, Web Page: https://campamento2015.progcomp.cl.

I was part of the organizing team of the First Chilean Training Camp of Competitive Programming (ICPCCL'15). This camp was open for Chilean students to prepare them for the upcoming ACM International Collegiate Programming Contest.

2012 - 2015 **Competitive Programming**, *Universidad de Chile*.

I participated as a coach of the university teams that participate in the ACM International Collegiate Programming Contest (ICPC). We won every Chilean competition in this period.

Professional Experience

March 2019 -
Present
Software Engineer, *AMTC*, http://www.amtc.cl/?page_id=6095.
I work in the field robotics laboratory of the Advanced Mining Technology Center, AMTC. I design, develop and extend libraries to build robotic behaviors using ROS. These libraries have special requirements such as: remote communication, monitoring and data given by robotic operators. I also design and develop GUIs for robotic operators.

January 2018 -
January 2019
Full-Stack Developer, *LaBot*, http://www.labot.cl.
I developed a bot for Telegram and Facebook Messenger to send news to its users. I developed intuitive interfaces for journalists to write news in a format understandable by the bot.

May 2013 -
February 2014
Back-End Developer, *Pivto*, http://www.pivto.com.
Developer of plugins for web pages. The plugins extend web pages giving them the capacity to have their own social networks. I developed tools to extract pictures and posts from many social networks and then showed them in real time.

August 2012 -
April 2013
Web Developer, *Bufys*, http://www.bufys.com.
Designer and programmer of the first Latin American crowd gifting platform.

September 2011 -
January 2012
Research Assistant, *School of Economics and Business*, University of Chile.
Researcher and programmer of novel algorithms of data mining and data classification.

Awards

2016
Graduate Students' Academic Projects, *University of Chile*, Fund raised.
Title: Towards Duckietown in the FCFM.
With the Robotic Community of the University of Chile.
Amount: $4,170.

2012
Second Place in Programming Contest, *Acid Labs*, Bufys.
The contest goal was to develop an innovative gift recommending algorithm using social networks.

2011
First Place in ACM-ICPC Programming Contest, *Chile*.
Member of the national winning team in the International Collegiate Programming Contest (ICPC) organized by Association for Computing Machinery (ACM).

Additional Information

External Reviewer.
○ 34th ACM/SIGAPP Symposium On Applied Computing, Software Engineering Track

Invited Talks.
○ Computer Science Summer School of Cochabamba 2017: I gave a talk about Software Engineering in Robotics and a tutorial about programming self-driven vehicles.

Visited Research Labs.
○ Software Engineering Lab - University of Mons (Mons, Belgium). September 21 - November 10, 2016. Contact: Tom Mens
○ RMoD - INRIA Lille Nord Europe (Lille, France). September 21 - October 2, 2015. Contact: Marcus Denker
○ RMoD - INRIA Lille Nord Europe (Lille, France). August 25 - September 5, 2014. Contact: Marcus Denker
○ CAR - Ecole des Mines (Douai, France). August 26 - 27, 2014. Contact: Jannik Laval

Student Volunteer.
○ International Symposium on Robotic Research 2017 - ISRR 2017
○ 22th International Smalltalk Conference - ESUG 2014

Doctoral Events.
○ Doctoral Consortium - International Symposium on Robotic Research 2017 - ISRR 2017
○ ACM Student Research Competition - 39th International Conference on Software Engineering - ICSE 2017

Development Skills.

○ *Robotic Development* Since 2014 I have been involved with robotic development thanks to my PhD. I develop research tools using Pharo Smalltalk, Python, C++ and LRP (my own live programming language).

○ *Software Engineering* Since my engineering degree I work as a software engineer. I use several techniques, such as TDD and Live Programming when developing software. I lead a small developers team while designing software.

○ *Web Development* Since 2010 I have been working as a back-end developer in several web application projects. I use TDD practices and MVC frameworks. I used PhP Zend framework in the past and currently I use Ruby on Rails for this purpose.

Languages.

○ Spanish: Native
○ English: Fluent Written and Spoken