

# Miguel A. Solís Cid

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## CONTACT INFORMATION

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Depto. 706. Antofagasta, Chile.

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## RESEARCH INTERESTS

adaptive control, reinforcement learning, robotics.

## EDUCATION

**Universidad Técnica Federico Santa María**, Valparaíso, Chile

Dr.Eng., Informatics, April, 2017.

- Dissertation Topic: “Reinforcement Learning on Control Systems with Unobserved States”.
- Advisor: Héctor Allende / Manuel Olivares

M.Sc., Electronics, August, 2012.

- Masters Project: “State estimation of systems observed over erasure channels”.
- Advisor: Eduardo Silva

Electronics Engineering, August, 2012.

## CAREER EXPERIENCE

**Universidad Católica del Norte**, Antofagasta, Chile

### **Interim Academic**

**July, 2018 - today**

Full-time position for Computing & Systems Engineering Dept.

#### **Courses:**

- Operating Systems, 2019, 02-2018
- Robotics Fundamentals, 02-2019, 02-2018
- Internet of Things, 01-2019

**Universidad Andrés Bello**, Viña del Mar, Chile

### **Instructor**

**April, 2017 - June, 2018**

Full-time position for Informatics Department at Engineering Faculty.

**Academic Assessment Score:** 4.0/5

Part-time Lecturer

**August, 2013 - March, 2017**

#### **Courses:**

- INF-1202 Computers Architecture, 01-2018, 01-2017, 01-2016.
- INS-121 Computer Programming I (Python 2.7), 01-2018, 01-2014.
- ICF-122 Programming Fundamentals (C), 02-2017.
- INF-1203 Operating Systems, 02-2017, 02-2016, 02-2015.
- ITC-1701 Computer Networks, 01-2017, 01-2016, 01-2015.
- INS-243 Smart City Apps (co-taught), 01-2017, 01-2016.

### *Undergraduate Supervision*

Advisor for undergraduate thesis on informatics engineering.

- Indoor Control: Sistema de monitoreo y control para cultivos de interior - Javier León 2017.
- Control de acceso dactilar - Gabriel Contreras 2017.
- Conversando con R.I.T.A. (Robotic Internet of Things Assistant) - Gonzalo Burgos 2017.
- Laboratorio remoto de robótica educativa - Gonzalo Contreras 2018.

### **Universidad Técnica Federico Santa María, Valparaíso, Chile**

#### *Part-time Lecturer*

**August, 2012 - June, 2018**

Co-taught undergraduate level courses for first-year students. Shared responsibility for lectures, exams and grades.

- IWI-131 Computer Programming (Python 2.7.x), 01-2018, 2017, 2016, 2015, 01-2014, 2013, 02-2012.
- IWG-101 Introduction to Informatics Engineering, 02-2013.

### *Undergraduate Supervision*

Co-advisor for undergraduate thesis on informatics engineering.

- Generación de estrategia defensiva en RoboCup SSL con aprendizaje reforzado Franco Ollino 2016.

## PUBLICATIONS

### **Journal Articles (WoS indexed)**

- [1] M.A. Solis, M. Olivares and H. Allende. A Switched Control Strategy for Swing-Up and State Regulation for the Rotary Inverted Pendulum. *Studies in Informatics and Control*, 28(1): 45-54, 2019. ISSN 1220-1766.
- [2] M.A. Solis, M. Olivares and H. Allende. Stabilizing Dynamic State Feedback Controller Synthesis: A Reinforcement Learning Approach. *Studies in Informatics and Control*, 25(2): 245-254, 2016. ISSN 1220-1766.
- [3] E.I. Silva and M.A. Solis, ‘An alternative look at the constant-gain Kalman filter for state estimation over erasure channels’, *IEEE Transactions on Automatic Control*, 58(12): 3259-3265, 2013. ISSN 0018-9286.

### **Book Chapters**

- [1] O. Silva and M.A. Solis, ‘Evolutionary Function Approximation for Gait Generation on Legged Robots’. *Nature-Inspired Computing for Control Systems*, Springer, 2016. Editor: Hiram Ponce. DOI: 10.1007/978-3-319-26230-7.

### **Conference Proceedings (Scopus indexed)**

- [1] F. Ollino, M.A. Solis and H. Allende, ‘Batch Reinforcement Learning on a RoboCup SSL keep-away strategy learning problem’. *Proceedings of the 4th Congress on Robotics and Neuroscience*, 2018.
- [2] P. Navarrete, C.J. Nettle, C. Oliva and M.A. Solis, ‘Fostering Science and Technology Interest in Chilean Children with Educational Robot Kits’. *Proceedings of the 13rd IEEE Latin American Robotics Symposium*, 2016.

[3] G.A. Ahumada, C.J. Nettle and M.A. Solis, ‘Accelerating Q-learning through Kalman Filter Estimations applied in a RoboCup SSL Simulation’, Proceedings of the 10th IEEE Latin American Robotics Symposium, 2013.

[4] E.I. Silva and M.A. Solis, ‘An approach to stationary state estimation with missing data’, Proceedings of the 9th IEEE International Conference on Control & Automation, 2011.

## PROJECTS

### R&D Funding

[1] 19PAEI02-115402 Programa de apoyo para la generacin de Emprendimientos en IoT, Smart City and Smart Industry.  
Funded by CORFO.  
**Project leader** (2019)

[2] DI-1303-16/RG Self-aware and self-organizing things for reconfiguring Web mashups of things during runtime.  
Funded by UNAB.  
**Co-researcher** (2016-2017)

[3] FDI 2011 and FDI 2012 (students projects line) Equipo RoboCup F-180.  
Funded by Mineduc.  
**Project leader** (2012-2013)

## INVITED TALKS

[1] Aprendizaje reforzado: conceptos básicos y aplicaciones en robótica. VIII Escuela de Invierno para la Divulgación de la Robótica, Neurociencia y Nanotecnología. UTFSM - August, 2014.

[2] Introducción práctica al aprendizaje reforzado en aplicaciones de robótica. 4to Congreso de Robótica y Neurociencia (CRoNe 2018). UTFSM, Chile - November, 2018.

[3] Herramientas para cómputo y visualización de datos en python 3.x. 4to Congreso de Robótica y Neurociencia (CRoNe 2018). UTFSM, Chile - November, 2018.

[4] Introducción al aprendizaje reforzado con Jupyterhub. XIX Congreso Internacional de Informática y Sistemas (CIIS 2018). UNJBG, Perú - November, 2018.

[5] Aprendizaje reforzado en sistemas de control. IX Congreso Internacional de Computacin e Informtica del Norte de Chile (INFONOR 2018), Track Congreso Infonor & Tecnologías Emergentes. UNAP, Chile - September, 2018.

[6] Conceptos básicos de aprendizaje reforzado y sus aplicaciones en robótica. IX Congreso Internacional de Computacin e Informtica del Norte de Chile (INFONOR 2018), Track Robótica y Automática. UNAP, Chile - September, 2018.

[7] Aprendizaje reforzado: conceptos básicos y aplicaciones en robótica. Tutorial - XIII Escuela de Verano de Inteligencia Computacional (EVIC 2017). UV, Chile - December, 2017.

[8] Numpy y herramientas de visualización en python. Workshop - 3er Congreso de Robótica y Neurociencia (CRoNe 2017). UTFSM, Chile - October, 2017.

## Editorial Activities

- Member of the Editorial Board for *Mathematics and Computer Science* journal.  
ISSN: 2575-6036 Nov. 2018 - Nov. 2020

## Reviews

- IEEE Latin American Transactions
- SSCI 2019: IEEE Symposium Series on Computational Intelligence
- CRoNe 2019: 5th Congress on Robotics and Neuroscience
- INFONOR 2019: 10th International Conference on Computing and Informatics in Northern Chile
- CRoNe 2018: 4th Congress on Robotics and Neuroscience
- WDKE 2018: II Workshop on Data and Knowledge Engineering
- SSN 2018: IV School on Systems and Networks
- TICXED 2018: XIX Congreso Chileno de TICS para la Educación
- WDKE 2017: I Workshop on Data and Knowledge Engineering

## Jury Committee (invited)

- 2019. (M.Sc. on Informatics Engineering). Félix Nilo, *Navegación de un vehículo autónomo flotante (ASV) de bajo costo en un entorno semiestructurado*.  
**Universidad Católica del Norte**, Departamento de Ingeniería en Sistemas y Computación  
Director de Tesis: M.Sc. Ricardo Pérez.
- 2019. (M.Sc. on Informatics Engineering). Carolina Silva, *Diseño, caracterización y fabricación de una pinza robótica interconectable modular con robótica blanda*.  
**Universidad Católica del Norte**, Departamento de Ingeniería en Sistemas y Computación  
Director de Tesis: Dr. José Gallardo.
- 2019. (M.Sc. on Electronics Engineering). Hans Lehnert, *Mecanismos Bio-Inspirados Aplicados a Tareas de Navegación en Agentes Artificiales*.  
**Universidad Técnica Federico Santa María**, Departamento de Electrónica  
Director de Tesis: Dr. María José Escobar.
- 2017. (M.Sc. on Biomedical Engineering). Alvaro Jara, *Reproducción de la altitud barométrica del centro de masa de una persona a partir de videos de caídas*.  
**Universidad de Valparaíso**, Escuela de Ing. Civil Biomédica  
Director de Tesis: Dr. Pablo Reyes.

## Organizing Committee of Conferences

- General Chair of Latin American Summer School on Cognitive Robotics 2020
- General Chair of CRoNe 2016: 2nd Congress on Robotics and Neuroscience
- General Chair of CRoNe 2015: 1st Congress on Robotics and Neuroscience

## Program Committee of Conferences

- Workshops Chair of IEEE ICDL-EpiRob 2020: International Conference on Development and Learning, and on Epigenetic Robotics
- CRoNe 2019: 5th Congress on Robotics and Neuroscience
- (Emergent Technologies Track) Co-chair at INFONOR 2019: 10th International Conference on Computing and Informatics in Northern Chile
- CRoNe 2018: 4th Congress on Robotics and Neuroscience
- WDKE 2018: II Workshop on Data and Knowledge Engineering at INFONOR 2018
- TICXED 2018: XIX Congreso Chileno de TICS para la Educación at JCCC 2018

## AWARDS AND HONORS

- Academic Excellence Award, Graduate School, Universidad Técnica Federico Santa María 2017
- Doctoral Scholarship, Universidad Técnica Federico Santa María 2012 - 2017
- Scientific Research Initiation Program, Universidad Técnica Federico Santa María 2015
- Visiting Scholar, University of Texas at Arlington Aug.2014 - Feb.2015  
Learning and Adaptive Robotics Lab.  
Supervisor: Dr. Manfred Huber
- Master in Science Scholarship, Universidad Técnica Federico Santa María 2010 - 2012
- Scientific Research Initiation Program, Universidad Técnica Federico Santa María 2011
- List of Honor of Students of Universidad Técnica Federico Santa María 2009 - 2012

## ENGLISH SKILLS

- TOEFL: Sept., 2016

Skill	Level
Reading	High (22-30)
Listening	Intermediate (14-21)
Speaking	Intermediate (14-21)
Writing	Intermediate (14-21)

- Total score: 80

COMPUTER SKILLS	<ul style="list-style-type: none"> <li>• Robotics Simulators: RobotinoSIM, Roboguide.</li> <li>• Languages: C, Python, Matlab, some use of Unix shell scripts, LabView, L<sup>A</sup>T<sub>E</sub>X.</li> </ul>	
MISCELLANEOUS	<ul style="list-style-type: none"> <li>• Technical Consultant Asesorías y Servicios Tribológicos del Norte Grande S.A.</li> <li>• Volunteer adviser at <i>Investigación Científica Escolar</i> PAR Explora Antofagasta</li> <li>• Microdegrees program Coordinator <a href="http://www.innovacionyrobotica.com/microgrados">http://www.innovacionyrobotica.com/microgrados</a></li> <li>• Competitive Programming Coach UNAB - Olimpiadas Chilenas de Informática</li> <li>• Technical Consultant <a href="http://www.centrosteam.com">http://www.centrosteam.com</a></li> <li>• Co-organizer Latin American Robotics Week <a href="http://www.roboticsweekLA.com">http://www.roboticsweekLA.com</a></li> <li>• Speaker at Vocational workshops for school students entitled ‘Educación Futuro’ Universidad Andrés Bello</li> <li>• Member of ‘Equipo RoboCup’, Innovación y Robótica Estudiantil, UTFSM</li> <li>• Member of ‘Equipo Lego’, Innovación y Robótica Estudiantil, UTFSM</li> </ul>	<p>2019 - today</p> <p>2019</p> <p>2017 - today</p> <p>2017</p> <p>2016 - 2018</p> <p>Oct. 27-29, 2016</p> <p>Sept. 2015</p> <p>2011 - 2014</p> <p>2009 - 2011</p>
PROFESSIONAL AFFILIATIONS	<ul style="list-style-type: none"> <li>• IA-LATAM, Member</li> <li>• IEEE Technical Committee on Neuro-Robotics Systems, Member</li> <li>• Centro de Innovación y Robótica, General Secretary</li> <li>• IEEE RAS (Robotics and Automation Society), Member</li> <li>• IEEE, Member</li> </ul>	<p>2019 - today</p> <p>2019 - today</p> <p>2017 - today</p> <p>2014 - today</p> <p>2011 - today</p>