

Miguel A. Solís Cid

CONTACT INFORMATION

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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

- [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

- [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] 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)

[2] 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 Computación e Informática 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 Computación e Informática 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.

SCIENTIFIC ACTIVITIES

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

- 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

- Robotics Simulators: RobotinoSIM, Roboguide.
- Languages: C, Python, Matlab, some use of Unix shell scripts, LabView, L^AT_EX.

MISCELLANEOUS	• Microdegrees program Coordinator http://www.innovacionyrobotica.com/microgrados	2017 - today
	• Competitive Programming Coach UNAB - Olimpiadas Chilenas de Informática	2017
	• Technical Consultant http://www.centrosteam.com	2016 - 2018
	• Co-organizer Latin American Robotics Week http://www.roboticsweekLA.com	Oct. 27-29, 2016
	• Speaker at Vocational workshops for school students entitled 'Educación Futuro' Universidad Andrés Bello	Sept. 2015
	• Member of 'Equipo RoboCup', Innovación y Robótica Estudiantil, UTFSM	2011 - 2014
	• Member of 'Equipo Lego', Innovación y Robótica Estudiantil, UTFSM	2009 - 2011
PROFESSIONAL AFFILIATIONS	• IA-LATAM, Member	2019 - today
	• IEEE Technical Committee on Neuro-Robotics Systems, Member	2019 - today
	• Centro de Innovación y Robótica, General Secretary	2017 - today
	• IEEE RAS (Robotics and Automation Society), Member	2014 - today
	• IEEE, Member	2011 - today