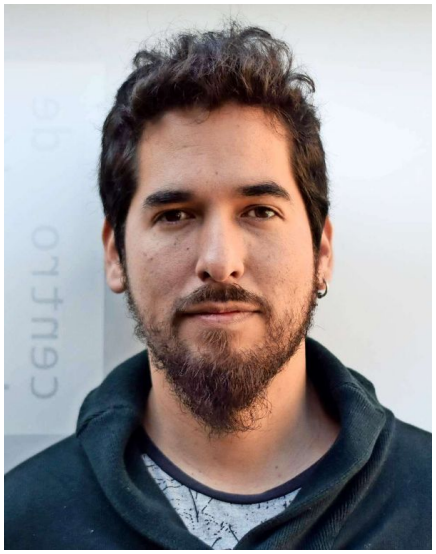

MIGUEL A. SOLIS

Head at Automation and Robotics Engineering,
Universidad Andrés Bello.

PROGRAMMING SKILLS

Python

C

NumPy, Pandas

Matlab

LabView

LaTeX

Unix

CONTACT

+56 9 8328 7452

miguel.solis@unab.cl

WORK EXPERIENCE

Head at Automation and Robotics Engineering — Feb. 20 - Today
Associate Professor 2023-today
Assistant Professor 2020-2022
Universidad Andrés Bello. Santiago, Chile

Undergraduate courses:

- Thesis supervision — 30 students
- Industrial Process Control — 2020
- Introduction to Automatic Control — 2020
- Electric Circuits and Machines — 2020
- Automata Theory and Formal Languages — 2023
- Computers Programming (Python 3.x) — 2024-2025

Graduate courses:

- Thesis supervision — 9 students
- Internet of Things — 2021
- Advanced Digital Networks — 2021-2022
- Data Science Projects — 2022
- Reinforcement Learning for Autonomous Agents — 2022-2023
- IoT and Blockchain — 2023-2024-2025

Invited Lecturer — 2023-2024
Universidad Adolfo Ibáñez. Santiago, Chile

Undergraduate courses:

- Internet of Things — 2024
- Programming Languages — 2024
- Data Structures & Algorithms — 2024
- Operating Systems — 2023

Graduate courses:

- Reinforcement Learning for Autonomous Agents — 2023

Invited Lecturer — 2022-2024
Universidad Central. Santiago, Chile

Graduate courses:

- Thesis supervision — 2 students
- Internet of Things — 2022-2024

EDUCATION

2012 - 2017

Dr.-Eng., Informatics
Universidad Técnica Federico Santa María
Reinforcement Learning on Control Systems with Unobserved States.
Supervisors:

- Prof. Héctor Allende, Informatics Dept.
- Prof. Manuel Olivares, Electronics Dept.

2010 - 2012

M.Sc., Electronics
Universidad Técnica Federico Santa María
State estimation of systems observed over erasure channels.
Supervisor:

- Prof. Eduardo I. Silva.

2006 - 2012

Electronics Engineering
Universidad Técnica Federico Santa María
Professional title with B.Sc. degree.

LANGUAGES

English

TOEFL
Sept. 2016

Reading
Listening
Writing
Speaking

- Robotics Fundamentals 2022-2023

Invited Lecturer 2023
Universidad Católica del Norte. Coquimbo, Chile

Taught courses:

- Artificial Intelligence 2023

Interim Academic Jul. 18 - Jan. 20
Universidad Católica del Norte. Antofagasta, Chile

Taught courses:

- Operating Systems 2018-2019
- Robotics Fundamentals 2018-2019
- Internet of Things 2019

Instructor Apr. 17 - Jun. 18
Universidad Andrés Bello. Viña del Mar, Chile

Undergraduate thesis supervision (4 students).
Taught courses:

- Computers Programming (Python) 2014-2018
- Computers Programming (C) 2016-2017
- Computer Architecture 2014-2017
- Operating Systems 2014-2017
- Computer Networks 2014-2017

Part-time lecturer Aug. 12 - Jun. 18
Universidad Técnica Federico Santa María. Valparaíso, Chile

Taught courses:

- Computers Programming (Python 2.x) 2012-2018

PUBLICATIONS

Journals Web of Science

[1] F. Cruz, **M.A. Solis** and N. Navarro-Guerrero. Cognitive inspired aspects of robot learning (**editorial**). Frontiers in Neurorobotics, **2023**. (e)ISSN 1662-5218.

[2] F. Cruz, T.G. Karimpanal, **M.A. Solis**, P. Barros and R. Dazeley. Human-aligned reinforcement learning for autonomous agents and robots (**editorial**). Neural Computing and Applications, **2023**. ISSN 0941-0643.

[3] R. Torres, **M.A. Solis**, R. Salas and A.F. Bariviera. A Dynamic Linguistic Decision Making Approach for a Cryptocurrency Investment Scenario. IEEE Access, vol.8: 228514-228524, **2020**. (e)ISSN 2169-3536.

[4] **M.A. Solis**, M. Olivares and H. Allende. A Switched Control Strategy for Swing-Up and StateRegulation for the Rotary Inverted Pendulum. Studies in Informatics and Control, 28(1): 45-54, **2019**. ISSN 1220-1766.

CONFERENCES (5 LAST YEARS)

IEEE SGSMA 2026

Local Organizing Committee
5th International Conference on Smart Grid Synchronized Measurements and Analytics

LACORO 2025

Finance & Grant Chair
Latin American Summer School on Cognitive Robotics

OpenRIT 6G

Local Chair
Open Research Infrastructures and Toolkits Workshop

LACORO 2024

Registration & Grant Chair
Latin American Summer School on Cognitive Robotics

IEEE ChileCon 2023

Program Committee
Chilean Conference on Electrical Electronic Engineering, Informatics and Communications Technology

SENTIROBOTS Workshop 2023

Technical Committee
2nd International Workshop on Sentiment Analysis and Emotion Recognition for Social Robots

TICXED 2023

Program Committee
Chilean Congress on IT and Education

ISR 2023

Technical Committee
International Symposium on Robotics

[5] **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.

[6] 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.

Journals Scopus

[1] J. Cornejo, S. Barrera, C.H. Ruiz, F. Gutierrez, M.O. Casasnovas, ... and E.A. L'huillier. Industrial, Collaborative and Mobile Robotics in Latin America: Review of Mechatronic Technologies for Advanced Automation, Emerging Science Journal, 7(4): 1430-1458, **2023**. (e)ISSN 2610-9182.

Conference Proceedings Scopus

[1] R. Torres, **M.A. Solis**, V. Martinez and R. Salas, A Nested-Cascade Machine Learning Based Model for Intrusion Detection Systems. IEEE Chilean Conference on Electrical, Electronics Engineering, Information and Communication Technologies (CHILECON), **2023**.

[2] F. Coiro, **M.A. Solis**, C.J. Nettle and A. Chila, Pre-robot: an open-source educational robotics platform for preschoolers. Proceedings of the 5th Congress on Robotics and Neuroscience, **2020**.

[3] 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**.

[4] 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**.

[5] 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**.

[6] 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**.

Book Chapters

[1] O. Silva and **M.A. Solis**, Evolutionary Function Approximation for Gait Generation on Legged Robots. In Nature-Inspired Computing for Control Systems, Springer, **2016**. Editor: Hiram Ponce.

PROJECTS

Advisor 2023

Sistema convertidor de plástico a combustible móvil.
Funded by: ANID Fondef VIU.

ALA 2023

Program Committee
Adaptive and Learning Agents Workshop at AAMAS 2023

LACORO 2023

Organizer
Latin American Summer School on Cognitive Robotics

ICoSR 2023

Technical Committee
2nd International Conference on Service Robotics

ALA 2022

Program Committee
Adaptive and Learning Agents Workshop at AAMAS 2022

ISR 2022

Technical Committee
International Symposium on Robotics

SENTI Workshop 2022

Technical Committee
International Workshop on Sentiment Analysis and Emotion Recognition for Social Robots

IWoSR 2021

Technical Committee
International Workshop on Service Robotics

TICXED 2021

Program Committee
Chilean Congress on IT and Education

HARL 2021

Co-organizer
Workshop on Human-aligned Reinforcement Learning for Autonomous Agents and Robots at IEEE ICDL 2021

Principal Investigator 2023

exploreCSR program (explore Computer Science Research) + Supplemental REU Funding (research experience for undergraduates).
Funded by: Google Research.

Principal Researcher from Chilean group 2021-2023

Red de prevención, mitigación y rehabilitación de áreas afectadas por incendios forestales (REDPREMIA).
Funded by: Programa Iberoamericano de Ciencia y Tecnología para el Desarrollo CYTED.

Advisor 2020-2022

Robótica educativa a distancia para actividades docentes a través de laboratorios remotos de alta disponibilidad y escalabilidad.
Funded by: Fundación Gabriel & Mary Mustakis.

Co-researcher 2016-2017

Self-aware and self-organizing things for reconfiguring Web mashups of things during runtime.
Funded by: Universidad Andrés Bello.

Project leader 2012-2013

Equipo RoboCup F-180 (students line)
Funded by: Mineduc (FDI 2011 and FDI 2012).

PATENTS

Software patent 2024
Departamento de Derechos Intelectuales, Chile.

I. Jirón, M.A. Solis, D. Urrutia, J. Littin. Autenticación Neuronal de Dispositivos en Redes IoT. Granted on August 12, 2024.

EDITORIAL ACTIVITIES

Guest editor 2023
Neural Computing and Applications

Part of the guests editors for Topical Collection (Special Issue) on Human-aligned Reinforcement Learning for Autonomous Agents and Robots.

Guest editor 2023
Frontiers in Neurorobotics

Part of the guests editors for Research Topic on Cognitive Inspired Aspects of Robot Learning.

IEEE ICDL 2020

Workshops Chair
International Conference on Development and Learning

LACORO 2020

Organizer
Latin American Summer School on Cognitive Robotics

TICXED 2020

Program Committee
Chilean Congress on IT and Education

CRoNe 2019

Program Committee
5th Congress on Robotics and Neuroscience

INFONOR 2019

Track co-chair
10th International Conference on Computing and Informatics in Northern Chile

AWARDS

2024

Inspiring Lecturer
Direccion General de Desarrollo Estudiantil, UNAB

2022

Senior Membership Elevation
IEEE

2020

Excellent Oral Presentation
5th Congress on Robotics and Neuroscience

2017

Academic Excellence Award
Graduate School, Universidad Técnica Federico Santa María

Journal Reviews

- IEEE Latin America Transactions.
- IEEE Transactions on Smart Grid.
- IEEE Transactions on Systems, Man and Cybernetics: Systems.
- BioMedical Engineering Online.
- Neural Computing and Applications.

INDUSTRY AND CONSULTANCY

Technical Consultant 2024
Akasa - Antofagasta, Chile

Technical consultancy

Advisor 2021-2023
Centro de Innovación y Robótica - Valparaíso, Chile

Technical advisor

Cybersecurity Board at Senate of Chile 2022

Part of the Cybersecurity Board within the Future Challenges, Science, Technology and Innovation Committee at Senate of Chile.

Technical Consultant 2019-2020
STNG - Antofagasta, Chile

Technical consultancy

INVITED TALKS

Tutorial

2nd International School on Artificial Intelligence and Data Science Applications 2025
Programación de ESP32 e integración con Amazon Alexa.

Tutorial

IEEE Latin American Robotics Symposium 2024
Practical Introduction to Reinforcement Learning with Gym in Python.

Tutorial

Escuela Internacional de Primavera sobre Entornos Ubicuos y Aplicaciones de Robots Sociales
Introducción práctica al aprendizaje por refuerzos con Gym en Python.

2011 and 2015

Scientific Research Initiation Program
Universidad Técnica Federico Santa María

2009 to 2012

List of Honor of Students
Universidad Técnica Federico Santa María

EXTERNAL EXAMINER

Dr. em Engenharia de Computação (2024)

Cristian Millan.
Universidade de Pernambuco.

Teaching Proxemic Behavior to Cognitive Agents with Reinforcement Learning.
Advisor: Prof. Bruno Torres Fernandes

Dr.Sc. on Automation Engineering (2021)

Oscar Loyola.
Universidad de Santiago de Chile.
Nueva metodología para la interacción entre múltiples robots cognitivos basados en elementos jerárquicos.
Advisor: Prof. John Kern

M.Sc. on Biomedical Engineering (2020)

Mailyn Calderón.
Universidad de Valparaíso.

Biomechanical signal processing and machine learning frameworks for the human movement analysis.
Advisor: Prof. Carolina Saavedra.

M.Sc. on Informatics Engineering (2019)

Rubén Castro.
Universidad Católica del Norte.

Tutorial

Arduino Day 2023 Chile
Carga inalámbrica de código en Arduino.

Tutorial

Arduino Day 2022 Chile
Programación de Arduino mediante CLI.

Plenary Talk

CIIS 2021: XXII Congreso Internacional de Informática y Sistemas.
Toma de decisiones con un enfoque difuso para transacciones con criptomonedas.

Tutorial

Arduino Day 2021 Chile
Programación de Arduino mediante CLI.

Plenary Talk

CIIS 2019: XX Congreso Internacional de Informática y Sistemas.
Agregación de información con lógica difusa para la toma de decisiones en entornos dinámicos.

Plenary Talk

CIIS 2018: XIX Congreso Internacional de Informática y Sistemas.
Introducción al aprendizaje reforzado con Jupyterhub.

Plenary Talk

CRoNe 2018: IV Congress on Robotics and Neuroscience.
Introducción práctica al aprendizaje reforzado con aplicaciones en robótica.

Tutorial

CRoNe 2018: IV Congress on Robotics and Neuroscience.
Herramientas para cómputo y visualización de datos en Python 3.x.

Tutorial

EVIC 2017: XIII Escuela de Verano de Inteligencia Computacional.
Aprendizaje reforzado: conceptos básicos y aplicaciones en robótica.

Tutorial

CRoNe 2017: III Congress on Robotics and Neuroscience.
NumPy y herramientas de visualización en Python.

Diseño e implementación de un sistema de control de nivel no lineal para ensayos de controladores basados en sistemas inteligentes.
Advisor: Prof. José Gallardo.

M.Sc. on Informatics Engineering (2019)

Félix Nilo.
Universidad Católica del Norte.

Navegación de un vehículo autónomo flotante (ASV) de bajo costo en un entorno semiestructurado.
Advisor: Prof. Ricardo Pérez.

M.Sc. on Informatics Engineering (2019)

Carolina Silva.
Universidad Católica del Norte.

Diseño, caracterización y fabricación de una pinza robótica interconectable modular con robótica blanda.
Advisor: Prof. José Gallardo.

M.Sc. on Electronics Engineering (2019)

Hans Lehnert.
Universidad Técnica Federico Santa María.
Mecanismos Bio-Inspirados Aplicados a Tareas de Navegación en Agentes Artificiales.
Advisor: Prof. María José Escobar.

MEMBERSHIPS

IEEE, Member	+16 years
IEEE RAS, Member	+11 years
Centro de Innovación y Robótica	+8 years
IEEE T.C. on Neuro-Robotics Systems	+7 years

MISCELLANEOUS

President — 2025 - 2026

President of the Executive Committee at IEEE Chile Centro Section.

Research Committee Delegate — 2023 - Today

Research Committee Delegate to the IFR (International Federation of Robotics) General Assembly.

President — 2023 - Today

President at NGO Centro de Innovación y Robótica.

Vice-President — 2023 - 2024

Vice-President of the Executive Committee at IEEE Chile Centro Section.

President — 2022 - 2023

President of the Executive Committee at Technical Chapter IEEE Robotics and Automation Society Chile Centro Section.

Academic Committee at Professional Master — 2021 - Today

Part of the Academic Committee at Professional Master degree Magíster en Tecnologías de la Información y Telecomunicaciones. UNAB.

Volunteer adviser at PAR Explora Antofagasta — 2019

Volunteer adviser in Investigación Científica Escolar (Science Research for School Students) activity within PAR Explora Antofagasta.

General Secretary — 2017-2023

General Secretary at NGO Centro de Innovación y Robótica.

Competitive Programming Coach — 2017

Volunteer coaching for competitive programming groups from different schools, aiming to participate at the Olimpiadas Chilenas de Informática (Chilean Olympics on Informatics).