



MIGUEL A. SOLIS

Head at Automation and Robotics Engineering,
Universidad Andrés Bello.

WORK EXPERIENCE

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

Feb. 20 - Today

PROGRAMMING SKILLS

Python



C



NumPy, Pandas



Matlab



LabView



L^AT_EX



Unix



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

Graduate courses:

- Thesis supervision 6 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

Invited Lecturer

Universidad Adolfo Ibáñez. Santiago, Chile

2023-2024

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

Universidad Central. Santiago, Chile

2022-2024

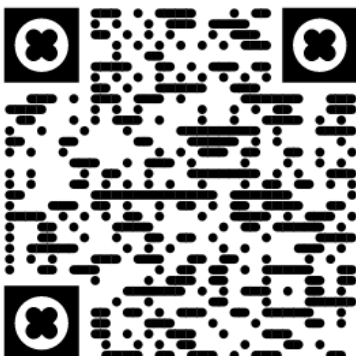
Graduate courses:

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

CONTACT

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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

Universidad Católica del Norte. Coquimbo, Chile

2023

Taught courses:

- Artificial Intelligence

2023

Interim Academic

Universidad Católica del Norte. Antofagasta, Chile

Jul. 18 - Jan. 20

Taught courses:

- Operating Systems
- Robotics Fundamentals
- Internet of Things

2018-2019

2018-2019

2019

Instructor

Universidad Andrés Bello. Viña del Mar, Chile

Apr. 17 - Jun. 18

Undergraduate thesis supervision (4 students).

Taught courses:

- Computers Programming (Python)
- Computers Programming (C)
- Computer Architecture
- Operating Systems
- Computer Networks

2014-2018

2016-2017

2014-2017

2014-2017

2014-2017

Part-time lecturer

Universidad Técnica Federico Santa María. Valparaíso, Chile

Aug. 12 - Jun. 18

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 State Regulation for the Rotary Inverted Pendulum. *Studies in Informatics and Control*, 28(1): 45-54, **2019**. ISSN 1220-1766.

CONFERENCES (5 LAST YEARS)

LACORO 2024

Registration & Grant Chair
Latin American Summer School
on Cognitive Robotics

IEEE ChileCon 2023

Program Committee
Chilean Conference on Electrical
Electronic Engineering, In-
formatics 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 Ed-
ucation

ISR 2023

Technical Committee
International Symposium on
Robotics

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

[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.

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 Sen-
timent Analysis and Emotion
Recognition for Social Robots

IWoSR 2021

Technical Committee
International Workshop on Ser-
vice Robotics

TICXED 2021

Program Committee
Chilean Congress on IT and Ed-
ucation

HARL 2021

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

IEEE ICDL 2020

Workshops Chair
International Conference on De-
velopment and Learning

LACORO 2020

Organizer
Latin American Summer School
on Cognitive Robotics

TICXED 2020

Program Committee
Chilean Congress on IT and Ed-
ucation

CRoNe 2019

Program Committee

Principal Investigator

2023

exploreCSR program (explore Computer Science Research) + Supple-
mental 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 in-
cendios 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 lab-
oratorios 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 As-
pects of Robot Learning.

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

Dirección 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

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.

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

Akasa - Antofagasta, Chile

2024

Technical consultancy

Advisor

Centro de Innovación y Robótica - Valparaíso, Chile

2021-2023

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

STNG - Antofagasta, Chile

2019-2020

Technical consultancy

INVITED TALKS

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.

Tutorial

Arduino Day 2023 Chile

Carga inalámbrica de código en Arduino.

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)

Maily Caldeón.

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.

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.

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, 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.

M.Sc. on Biomedical Engineering (2017)

Alvaro Jara.

Universidad de Valparaíso.

Reproducción de la altitud barométrica del centro de masa de una persona a partir de videos de caídas.

Advisor: Prof. Pablo Reyes.

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 Magister 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).