Andres Rico Medina

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Education

Massachusetts Institute of Technology (USA)   **2022 - Present**

PhD. Media Arts and Sciences

- City Science Research Group - MIT Media Lab
- Topics: Community-based IoT, Sensing, Data Analytics, Machine Intelligence , Water Security, Informal Settlements

Massachusetts Institute of Technology (USA)   **2020 - 2022**

M.Sc. Media Arts and Sciences

- City Science Research Group - MIT Media Lab
- Thesis: Socio-Environmental Sensor Networks for Community Sensing
- Coursework: How To Make (Almost) Anything | Biological Instrumentation and Measurement | Science Fiction Fabrication | Settlements Without | Wireless Sensing Technologies | Affective Computing and Ethics | How To Grow (Almost) Anything | Adventures in Sensing | Ocean Internet of Things | Sensor Technologies for Interactive Environments

Tecnológico de Monterrey, Monterrey Campus (Mexico)   **2014 - 2019**

B.Sc. Robotics & Artificial Intelligence (Major), Innovation (Minor)

- Magna Cum Laude
- Selected Coursework: Mathematics (1-4) | Physics (1-3) | Chemistry (1-2) | Electronics and Circuits (1-3) | Intelligent Systems | Computational Intelligence | Applied Robotics | Sensors and Actuators | Multi-agent Systems | Machine Learning | Prototyping Techniques | Innovation Methodologies | Innovation Viability | Entrepreneurship | Economics (Micro/Macro) | Statistics (1-2) | Material Mechanics | Manufacturing Processes | Intro to Bio-engineering | MEMS | Ethics in Engineering (1-2)

MIT Professional Education (USA)   **2015 - 2017**

Certificate on Innovation and Technology

- Certificate Modules: "The Invention Process: Invention in the context of Innovation" | "Beyond Smart Cities" | "Innovation: Beyond the Buzzword" | "Mastering Design Thinking and Innovation"

Tecnológico de Monterrey, Monterrey Campus (Mexico)   **2016**

i Semester - Business Administration and Entrepreneurship

- 6 month experiential learning in entrepreneurial finance, negotiation, marketing, product design, business model design and management.

Professional Experience

MIT Media Lab   **2018 - Present**

Research Assistant City Science Group   2020 - Present

- Invented water management sensing system for informal communities (electronics design, backend, frontend, database architecture, embedded programming).
- Developed hybrid machine learning models for classifying room occupancy in classrooms and office spaces using CO2 and optical environmental sensors (backend, frontend, LSTM Neural Network Architecture, Spectral Clustering).
- Designed low-cost water quality sensor nodes for profiling coastal ocean waters.
- Constructed portable bio-sensing reactor along with an open-source platform for scaling the technology.
- Collaboration, research development, and partnership coordination tasks with Panasonic Corporation, Samsung, Banco Azteca, US National Park Service, Government of Andorra, Tec de Monterrey, CS Lab Guadalajara, CS Lab Gipuzkoa & CS Lab Bio Bio.

Teaching Assistant   2021 - 2023

- MIT Center for Bits & Atoms - How To Make (Almost) Anything - Electronics, input and output devices.
- MIT Media Lab - How To Grow (Almost) Anything - Bio sensing and bio reactor modules.

Visiting Researcher City Science Group   2019 - 2020

- Implemented environmental and mechanical sensor system for prototypical electric and shared bicycle systems for applications in Japan and USA (National Park System) in collaboration with Panasonic Corporation.
- Advanced unsupervised machine learning algorithms for assessing city infrastructure conditions and user commuting preferences using distributed sensor systems.
- Built embedded environmental sensors for alpine skis used for crowdsourcing environment, athlete, equipment and snow conditions in mountains and ski resorts. Project was carried out in collaboration with technology and governmental officials from the Principality of Andorra.

Visiting Student City Science Group 2018 - 2019

- Development of safety sensors for operation of dynamic robotic office environments. Sensors detected possible obstructions in robotic actuator paths and could localize human subjects within closed office spaces.
- Created emotion tracking sensors, interfaces and algorithms for urban affective computing applications.

MIT REAP Team Monterrey 2017 - 2019
Co-Founder & Project Manager

- Established and managed program focused on the development of regional strategies for fostering innovation driven entrepreneurship partnered with leaders from academia, industry, venture capital and government in the state of Nuevo Leon, México.
- Built and implemented a regional data hub and evidence based methodologies for driving policies that will facilitate technology based start-up development in the Monterrey region.
- Kickstarted initiatives like the "Monterrey Venture Cafe" and "Monterrey Demo Days", spaces that seek to connect students and entrepreneurs with venture capital investments.

Tec de Monterrey School of Engineering 2016 - 2019
Undergraduate Researcher

- Development and integration of award winning artificial intelligence implementations and models for competition robotics.
- Designed computer vision algorithms for humanoid robot navigation tasks.
- Designed HCI systems and prototypes for enhancing user wellbeing in the area of decentralized medicine.
- Development of 2D manufacturing techniques and designs for low-cost wheeled vehicles.

OGMA Design + Innovation Firm 2015 - 2017
Co-Founder and Technological Innovation Leader

- Co-Designed and created business model for innovation consulting firm.
- Created innovation methodology used by firm for improving customer experience in hospitality sectors.
- Led technology team on projects for the adaptation of infrastructure for wireless charging systems in Monterrey, Mexico.
- Co-led company through graduation of Tecnológico de Monterrey's incubation program.
- Co-led company through graduation of Tecnológico d Monterrey's I-Semester program.

Skills

Programming

- Database management (SQL, PostgreSQL) | Embedded Programming (C++, Lab VIEW) | Web Development (JavaScript, HTML, CSS, PHP) | Data Analytics, Robotics and AI (Python, MATLAB) | Simulation (MATLAB, GAMA, NetLogo, Simulink) | Networking & Communications Protocols (Serial, i2c, SPI, BLE, WiFi, LoRa, Espnow)

Manufacturing

- Additive Manufacturing (3D printing [SLA, FDM]) | Subtractive Manufacturing (Computer Controlled Cutting, Computer Controlled Milling, Computer Controlled Machining, Electronics Production, Moulding, Casting, Soldering)

Computer Aided Design

- CAD (Fusion 360, Solid Works) | EDA (EAGLE, KiCAD) | 3D Scanning (Artec Studio) | Video (FFmpeg, iMovie) | Audio (Logic Pro) | 2D Design (GIMP, Figma, Canva)

Management

- Strategic Partnership Management | Innovation Management | Research Management | Innovation Feasibility Analysis | Innovation Viability Analysis | Business Model Design | Product-Market Fit | User Journey Design | User Experience Design

Publications

- *Rico, Andres, Kent Larson, and Mayra Gamboa. "Sensor platform for assessment of water usage patterns in informal settlements." Scientific Reports 13.1 (2023): 18958.*
- *Perry, E., Weber, J., Pataranutaporn, P. et al. How to grow (almost) anything: a hybrid distance learning model for global laboratory-based synthetic biology education. Nature Biotechnology, 2022.*
- *Rico, Andres, Suparnamaaya Prasad, and Kent Larson. "A low-cost, open-source, and distributed ocean profiling sensor node." 2022 IEEE Sensors Applications Symposium (SAS). IEEE, 2022.*
- *Rico, Andres, Carson Smuts, and Kent Larson. "Chameleon: Adaptive Sensor Intelligence for Smart Buildings." IEEE Internet of Things Journal 2022.*
- *Rico, Andres, Carson Smuts, Jason Nawyn and Kent Larson. "Embedded Piezoelectric Array for Measuring Relative Distributed Forces on Snow Skis." Proceedings of the Computing Conference. Springer, Cham, 2021.*
- *Rico, Andres, Yasushi Sakai, and Kent Larson. "Jettsen: A mobile sensor fusion platform for city knowledge abstraction." Proceedings of the Future Technologies Conference. Springer, Cham, 2020.*

- *Rico, Andrés, and Leonardo Garrido. "Feed Forward Classification Neural Network for Prediction of Human Affective States Using Continuous Multi Sensory Data Acquisition." Mexican International Conference on Artificial Intelligence. Springer, Cham, 2019.*

Memberships

Technology Judge	MIT Solve
Technology Board	National Park Service - WASO (Washington Office)
Technology Advisor	The Bridge Program (Boston)
Student Strategy Counselor	Innovation and Development Student Association (Student Development)
Student Strategy Counselor	Industrial and Systems Engineer Student Association (Student Development)
Digital Strategy Counselor	Huellas Que Trascienden (Rural/Cultural Development)
Instructor	METAS (Education Development)
Fund Procurement	TECHO (Rural Development)

Honors & Awards

2023 MIT Technology Review Innovator Under 35 LATAM	Issuer: MIT Technology Review
2023 Top 100 Innovators in Latin America	Issuer: Bloomberg Linea
2021 Rolex Sustainability Scholarship	Issuer: Rolex Institute & Norman Foster Foundation
2020 FTC Best Paper Award	Issuer: FTC Scientific Committee
2019 Magna Cum Laude	Issuer: Tecnológico de Monterrey
2019 LIFE Multi-faceted Award	Issuer: Tecnológico de Monterrey
2019 LIFE Combined Achievement Award	Issuer: Tecnológico de Monterrey
2018 National Robotics Competition SPL Mexico Champion	Issuer: Mexican Robotics Federation
2018 Santander Scholarship	Issuer: Santander Bank
2018 Conexión Tec Award for Best Software Development	Issuer: Tecnológico de Monterrey
2018 Outstanding Student Achievement Award	Issuer: ITESM School of Engineering and Sciences
2017 Top GPA of the School of Engineering Award	Issuer: ITESM School of Engineering and Sciences
2017 Outstanding Student Achievement Award	Issuer: ITESM School of Engineering and Sciences
2017 Adobe Innovation Challenge	Issuer: Adobe Systems Incorporated

Invited Talks

2023 Reimagining Mobility: Unlocking Open Data	Organizer: MUBIL (Spain)
2023 MIT Technology Review Innovators Under 35	Organizer: MIT Technology Review & Opinno (Peru)
2023 Innovaforum	Organizer: Universidad de Guadalajara (Mexico)
2023 MIT Media Lab Member's Week	Organizer: MIT Media Lab (USA)
2023 City Lab Bio Bio	Organizer: MIT Media Lab & CS Lab Bio Bio (Chile)
2023 Water's STEM Academy	Organizer: Water's Academy & MIT Media Lab (USA)
2022 Outsiiders	Organizer: Innovation Engineering Society Tec de Monterrey (Mexico)
2022 Banco Azteca Innovation Forum	Organizer: Banco Azteca & Google Mexico (Mexico)
2022 ClimateTech Conference	Organizer: MIT Technology Review (USA)
2022 City Science Summit	Organizer: MIT Media Lab & Norman Foster Foundation (USA)
2022 Innovaforum	Organizer: Universidad de Guadalajara (Mexico)
2022 Earth Week	Organizer: Tecnológico de Monterrey (Mexico)
2022 MIT Horizon	Organizer: MIT Open Learning (USA)
2021 IEEE Sensors and Applications	Organizer: IEEE (Sweden)
2021 Innoshare Network Meeting	Organizer: INNoshare University (Poland)
2021 IID Wow Talks	Organizer: Tec de Monterrey (Mexico)
2020 City Science Summit	Organizer: MIT Media Lab (USA)
2020 Future Technologies Conference	Organizer: Science and Information Conferences (Canada)
2020 The Science of Urban Planning	Organizer: General Consulate Mexico in Boston (USA)
2019 Applied Machine Learning Lecture	Organizer: Tecnológico de Monterrey (Mexico)
2018 Ciencia de las Ciudades	Organizer: MIT Media Lab X Universidad de Guadalajara (Mexico)
2016 INC Monterrey	Organizer: Tecnológico de Monterrey (Mexico)