Abraham Reyes Yanes

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PROFESSIONAL EXPERIENCE

- TE Connectivity- Automation Manufacturing Technologies (AMT) Global Operations, June 2021-Current.

  Principal Manufacturing and Development Engineer
  - Technical leader of the Mx team, reviewing technical plans and concepts for automation developments within all LATAM region implementations.
  - Create, develop and sustain a pipeline of automation and AI projects supporting manufacturing plants adoption of these technologies.
  - Create and deploy a development roadmap for 3D Bin Picking solutions , that include training, research and benchmark. Testing of commercial solutions and development of low-cost inhouse options.
  - Industrial Co-Leader of VAI Group (Vision and Artificial Intelligence) in collaboration with the University of Sonora. VAI is composed of interns highly trained on AI and computer vision that help leveraging AI deployments in the plants.

  Staff Manufacturing and Development Engineer
  - Lead TE AI CUP in LATAM, a global competition where engineers in the manufacturing plants collaborate with students' teams developing and deploying applications that make use of AI.
  - Machine Vision Development in 2D and 3D vision projects for high precision requirements using Keyence, Cognex , Halcon or Merlic MVTec.

  Sr. Manufacturing and Development Engineer
  - Develop automation concepts for TE Connectivity sites.
  - Simulate processes that involve new machinery to test functionality and/or current processes to improve key metrics. Development of AGVs simulation for potential applications.
  - Support all TE business units for automation improvement, included but not limited to automotive, industrial, warehouses
  - Develop AI machine vision applications.

- Ford Motor Company- Hermosillo Stamping and Assembly Plant- Hermosillo, Mexico January 2021 - June 2021.

  Stamping Maintenance Process Coach
  - Application of maintenance strategies to improve production cycles.
  - Response to machinery breakdowns and activities planning for maintenance technician's crew.

- University of Alberta- Mechanical Engineering Department- Edmonton, Canada, August 2018- January 2021.

  Research Engineer – Laboratory of Intelligent Manufacturing, Design and Automation (LIMDA)
  - Design, project management and fabrication of an experimental setup for automated vertical farming

  Graduate Research Assistant
  - Research development towards smart implementations in Aquaponics.
  - Computer vision implementations
  - Smart systems (prediction models) and data analysis in Python
  - Digital Twin framework development using IoT and Industry 4.0 concepts.

- LEAR Corporation, Just-in-Time Plant- Maintenance- Hermosillo, Mexico, October 2015- March 2017.

  Total Productive Maintenance (TPM) Coordinator
  - Planning and monitoring of the TPM corporative certification levels.

  Maintenance Supervisor
  - Planning and design of preventive and corrective maintenance routines.
  - Calculation and monitoring of MTTR, MTBF and OEE indicators.
  - Design and programming of PLC and HMI.

- University of Wisconsin- Polymer Engineering Center – Madison, USA, August 2014 - January 2015.

  Research Assistant
  - Research Assistant in the Design of a PVT-Dilatometer for the characterization of polymers.

PROJECTS AND PUBLICATIONS

- **Publications:**
  - Towards automated aquaponics a review on Monitoring, IoT and Smart Systems. Journal of Cleaner Production. Published- April 2020.
  - Wireless sensing module for IoT Aquaponics database construction. ICCMA Conference. Published. June 2020.
  - Real-time growth rate and fresh weight estimation for leafy crops in aquaponics systems using multi-instance segmentation. Journal Computers and Electronics in Agriculture. Published. October 2020.
  - Real-Time Implementation of Digital Twin for Robot Based Production Line, 11th Conference on Learning Factories 2021 – Published June 2021.

- Digital Twin and tracking system for Aquaponics Smart Systems. Sensors – June 2022.
- Pull Force AI Prediction: Enabling Non-Destructive Testing for Ultrasonic Welding Applications, TechCon, Durham, NC - November 2024.
- High Precision Vision-Guided Robotics Assembly and Laser Welding of Miniature Medical Devices, TechCon, Durham, NC - November 2024.

- **Projects:**
  - Design and programming of an interface for record and analysis maintenance order repairs using Java. Lear Corporation, Hermosillo, Sonora. Internal KAIZEN competition. March 2017.
  - Deep Learning Object Detection for Experiment Ballistic Analysis. Center for Design and Advance Materials (CDAM), University of Alberta- December- 2019.
- **Patents:**
  - 2022073 (USProv) - Automated Modular Rack for Aquaponic Grow Beds
  - 63/34,516 (USProv) - Automated Removal and Discarding Mechanism for Wire and Ring Assembly
  - 63/34,514 (USProv) - One Component Expansive Mandrel for Holding Multi-Size Miniature Rings.
  - 63/34,510 (USProv) - Robotic Dual Vacuum Nozzle for Pick and Place of Miniature Rings.
  - 63/34,509 (USProv) - Novel Wire Handling Insertion Mechanism and Method.
- **Granted Trade Secrets**
  - A Novel AI Method for Low Resolution (>100x100px) Defect Detection
  - Novel approach for Rapid Assembly Verification (RAV)
  - Synthetic defect generator for AI training datasets
  - Path re-arrangement segmentation method for a faster inference approach.
  - Expansion System for Internal Ring Securement and Rotation.

ACADEMIC BACKGROUND

(2018- 2020) MSc **Mechanical Engineering.**
University of Alberta, Edmonton, Canada.

(2010- 2015) Bachelor **Mechanical Engineering.**
Instituto Tecnologico de Hermosillo.

EXTERNAL ACTIVITIES

- **Invited Speaker / Conferences**
  - Presenting Technical work titled Pull Force AI Prediction: Enabling Non-Destructive Testing for Ultrasonic Welding Applications, TechCon, Durham, NC - November 2024.
  - Invited Conference Speaker, AI-Link Up 2024 organized by University of Sonora, Hermosillo, Sonora, 2024.
  - Invited Professional Networking Event forum for CIMM (International Congress for Mechanical and Mechatronic Engineering), Hermosillo, Sonora, November 2023.
  - Invited Conference Speaker, Manubyte Congress organized by ITSON (Technologic Institute of Sonora), Empalme, Sonora 2022.
  - Invited Conference Speaker, Manubyte Congress organized by ITSON (Technologic Institute of Sonora), Empalme, Sonora 2021.
  - Invited Conference Speaker: AI on Production Manufacturing Processes, CETyS University, Tijuana, Baja California, 2022.
  - Alumni forum for CIMM (International Congress for Mechanical and Mechatronic Engineering), Hermosillo, Sonora 2020.
- **Teaching Experience**
  - Industrial Invited Jury for the MSC Thesis ''Pronóstico de series de tiempo de las principales variables de operación del Molino SAG mediante algoritmos de Aprendizaje Máquina'', University of Sonora, 2024.
  - Lead 3 editions of the AI CUP in LATAM, training over +150 students from +10 different universities and participating in +30 AI related projects with manufacturing plants.
  - Lead machine vision and automation workshops. Train over +50 engineers in the use of AI , machine vision and automation technologies for manufacturing plants in 4 countries such as the USA, Mexico, Costa Rica and Brazil.
  - Lecturer Process Control, Department of Engineering, Instituto Tecnológico de Estudios Superiores de Monterrey (ITESM) Hermosillo, September 2022 - January 2023
  - Lecturer CAD/CAE/CAM – Mechanical Engineering and Mechatronics Engineering, Tecnológico Nacional de México (TECNM), Mechanical Engineering Department, Hermosillo, September 2020 - January 2021