Mario Alberto Mata Soto

Mechatronics Engineer

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Education

2016–2022 Mechatronics Engineering, Instituto Politécnico Nacional (IPN) - UPIITA.

Ave. Instituto Politécnico Nacional 2580, Gustavo A. Madero, Mexico City.

Technician in Digital Systems, Instituto Politécnico Nacional (IPN) - CECyT 9.

Mar Mediterráneo 227, Miguel Hidalgo, Mexico City.

Experience

Maintenance Assistant, Sistema de Transporte Colectivo (STC) - PCC II. December

2015-June Delicias 67, Cuauhtémoc, Mexico City.

> Maintenance and development of infrastructure and electromechanical equipment; capture and updating of maintenance reports and organization of technical documents; identification, analysis and solution of points of failure in the electronic equipment.

Professional Skills

Computing •Structured and object-oriented programming.

oProgram analysis and design.

oMicrocontroller programming.

Languages: C, C++, Java, Python, HTML, CSS, JavaScript.

Scientific software: MATLAB, Simulink, Mathematica, LabVIEW.

Other: Microsoft Office, Visual Studio Code, GeoGebra, LATEX, Adobe Premiere Pro, Adobe

Photoshop.

Electronics •Design of electrical and electronic circuits, and components selection.

oDesign and manufacture of PCBs.

•Design and implementation of control and automation systems.

•Interpretation and analysis of electrical diagrams.

oHandling and operation of tools and equipment for the implementation and diagnosis of electrical and electronic systems.

Software: Proteus Design Suite, Multisim, EAGLE, MPLAB.

Mechanics

•Design and selection of mechanical elements.

oInterpretation and analysis of drawings.

oHandling and operation of tools and equipment for the implementation and diagnosis of mechanical systems.

Software: SolidWorks, ANSYS Workbench, COMSOL Multiphysics.

Aptitudes & Attitudes

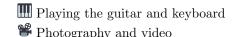
oAdaptability. •Self-taught. oCommitted. oLeadership. oCreativity. •Time management. •Analytical thinking. oPatient.

oTeam worker. oCommunication effective. oInitiative.

Languages A

Spanish (Native speaker) English (B1) German (60 hrs course/ Non-certified)

Hobbies •



Music composition and production Audiovisual content editing



Projects =

January Design and implementation of a tortilla machine head to control the tortilla

2020-August forming parameters

2021

A mechatronic system designed to produce corn tortillas, with 3 commercial sizes and thickness from 1 to 3 millimeters, using a GUI to control the production and obtain its most relevant statistics. The tortilla machine head presents an improvement in energy consumption compared to commercial models.

Tasks performed:

- oImage processing using MATLAB and Python.
- oDesign and selection of mechanical elements (SolidWorks, ANSYS Workbench).
- oPCBs design and sensor/actuator selection and conditioning (Proteus Design Suite).
- •Design of the algorithms for system control using Simscape.

November Design of an application in MATLAB for the recognition of dominoes Z

2020- Machine vision application capable of recognizing dominoes, using Hu invariant moments and neural networks.

December

Tasks performed:

2020

oCalculation of the invariant moments of Hu for each domino.

Neural network and image processing programming.

Design and simulation of a 2 DOF robot using SolidWorks and Simulink [2]

2020-July 2020

Modeling and simulation of a 2 DOF robot to implement different control laws and test its performance in trajectory tracking.

Tasks performed:

- oUse of SolidWorks with Simscape for simulation and validation.
- oProgramming of control laws and trajectory generators (MATLAB, Simulink).

August 2019- Design of an automatic system for efficient cleaning of photovoltaic arrays

December A mechatronic, intelligent and autonomous cleaning system, designed to remove dirt by means of microfiber to prevent 2019 deterioration and loss of efficiency in solar panel arrays.

Tasks performed:

- oProgramming of the control algorithms in STM32F446 system (C++).
- oDesign and selection of mechanical elements (SolidWorks).
- oPCBs design and sensor/actuator selection and conditioning (Multisim, EAGLE).

January Modeling and implementation of a 4-bar mechanism

2017-July Modeling and implementation of a 4-bar mechanism to verify the kinematic and dynamic model using Simulink.

2017 Tasks performed:

- Obtaining the kinematic and dynamic model of the mechanism.
- oMechanism control implementation using Simulink and Arduino.

January Design and implementation of a system for T-shirt folding

2016-July A system designed to simplify the task of folding T-shirts.

2016 Tasks performed:

- oProgramming of the control algorithm in a PIC16F877a microcontroller (MPLAB).
- oDesign and implementation of the PCBs for power supply and control of the system (Proteus Design Suite).