

# FRANCISCO MERCADO

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## EDUCATION

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**University of Wisconsin-Madison**, December 2015  
Bachelor of Science, *Mechanical Engineering* | 3.70/4.00  
Bachelor of Science, *Applied Mathematics* | 3.10/4.00  
Certificate, *Computer Science* | 3.80/4.00  
Overall GPA: 3.614/4.000

## WORK EXPERIENCE

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**Simulation Based Engineering Lab (SBEL)**, *Research Assistant*, Madison, WI Dec 2012 – Dec 2015  
Generated demos based on experiments from scientific journals (Nature) using an in-house physics engine, CHRONO. Demos include:  
Synchronization of a system of coupled oscillators (metronomes)  
Locomotion of a six-legged robot on granular terrain  
Mixing of sand-like particles in a rotating barrel

**Directional Striping Company**, *General Laborer*, Sun Prairie, WI May 2015 – Oct 2015  
Preparation and asphalt sealing parking lots and driveways.

**Elizabeth Waters Dining Hall**, *Team Member*, Madison, WI Aug 2011 – Dec 2012  
Server, Cashier, Chef's Assistant, Dishroom, Supply Transportation.

## PROGRAMMING LANGUAGES

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**C:** 14 mechatronics labs with an ATmega2560 including: Fixed point PID & DDA stepper motor control  
**C++:** CHRONO demos written in C++  
**MATLAB:** Created a 2D physics engine for kinematic and dynamic simulation of machine systems  
**Java:** Character recognition of handwritten digits through neural network, Open Street Map A\* path finder  
**EES** (Engineering Equation Solver): Analysis of thermodynamics, fluid dynamics, and heat transfer systems  
**Python:** Vigenère cypher cracker, YouTube channel video archiving, Mastermind Game (AI in progress)  
**Maple:** Static and Dynamic structural analysis  
**Fortran:** Introductory knowledge

## ACCOMPLISHMENTS

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**Lindbergh Lecture Presentation** Sep 2013  
Presented my research from the summer of 2013 at SBEL to UW-Madison Mechanical Engineering graduate students and faculty

**Recognition of Outstanding Student Employee (ROSE) Award** Mar 2012  
Award presented to the top 1% of housing employees (17 of 1700)

**Promoting the Computational Science Initiative (ProCSI)** July 2013 – July 2014  
Recruited, organized, and chaperoned a summer camp allowing under-represented high school students interested in engineering topics to experience tours, lab modules, and panels.

**Dean's List of Distinguished Students** (all semesters) Fall 2011 – Fall 2015

**Grainger Engineering Scholarship** Aug 2012 – May 2015

## COURSEWORK OF INTEREST

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Introduction to Artificial Intelligence | Cryptography | Linear Programming | AI in Robotics (Udacity)  
Kinematics and Dynamics of Machine Systems | Dynamic Systems  
Mechatronics in Control & Product Realization | Electro-mechanical Power Conversion  
Heat Transfer | Fluid Dynamic | Thermodynamics  
Applied Mathematical Analysis | Linear Algebra | Differential Equations