

Emmanuel J Rodriguez

Resumé



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PROFESSIONAL EXPERIENCE

Freelance Engineer

August 2020 – Present

Upwork

Remote

Upwork Profile: [upwork.com/fl/emmanueljrodriguez](https://www.upwork.com/fl/emmanueljrodriguez)

- Small unmanned aircraft vehicle (UAV) development, tasks included: electro-mechanical component selection (frame, flight-controller, power distribution board, electronic speed controllers, motors, propellers, GPS), vehicle control system integration (ArduPilot software), payload integration, assembly, flight testing, PID controller tuning, and flight data analysis.
- Product development for startup organizations through the design of mechanical components and assemblies using design for manufacturing (DFM) principles, while providing technical design direction in order to hit unit price targets.
- Implement numerical methods fundamentals to code general-purpose MATLAB programs.

Adjunct Professor

June 2018 – Present

National University

San Diego, CA / Remote

Promotions: from Adjunct Faculty to Core Adjunct Faculty, June 2020

- Mentor and equip students with the required skill-set to be successful professionals in the engineering profession while facilitating classroom discussions, and assessing student performance.
- Work collaboratively with colleagues as a team member of the BS in Manufacturing Design Engineering Five-Year Review Committee; the committee's objectives include program refinement to meet industry needs and ABET accreditation readiness preparation.

Manufacturing Engineer

June 2013 – June 2018

Raytheon Missile Systems

Tucson, AZ

Last performance evaluation: Far exceeds

Promotions: from E2 to E3, December 2014; from E3 to E4, June 2017

- Developed quality control procedures and optimal processing conditions to fabricate metallic airframe structures using novel additive manufacturing (AM) technology for aerospace hypersonic flight vehicle test units.
- Led the design of experiments (DOE) effort to screen and characterize the metals AM laser-directed energy deposition process – successfully completing the first step of the AM process plus material qualification plan.
- Redesigned airframe components via surface modeling techniques to implement DFM rules while generating efficient machine tool-path programs – achieved a part count reduction from 30+ sheet metal parts to one AM part, eight month schedule acceleration, and more than 50% cost savings.
- Collaborated with cross-functional teams to perform material characterization of untested AM nickel-based alloys to generate design-allowables data.
- Managed factory improvement projects, which entailed implementing factory control systems to drive manufacturing machine maintenance based on utilization rates – reducing labor and material costs by 60%.

EDUCATION

2011 – 2013 **Master of Science**

Mechanical Engineering
The University of Texas at El Paso

THESIS *Development Of A Thermal Imaging Feedback Control System In Electron Beam Melting*

2005 – 2010 **Bachelor of Science**

Mechanical Engineering
The University of Texas at El Paso

TECHNICAL SKILLS

PROFICIENT

Mechanical Design – CAD:

SolidWorks Siemens NX PTC Creo
Geometric Dimensioning & Tolerancing

Structural Analysis – FEA:

NX Nastran ANSYS Mechanical

Manufacturing:

Additive Mfg. (polymers and metals)

Quality Control & Design of Experiments:

MATLAB Statistics JMP – Data Analysis

INTERMEDIATE

Computational Fluid Dynamics (CFD):

ANSYS Fluent

Systems Simulation and Programming:

MATLAB Simulink LabVIEW

Visual Basic Pine Script

Predictive Analytics:

Python MATLAB Machine Learning

BEGINNER

Typesetting system: L^AT_EX

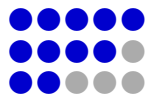
SOFT SKILLS

STRONG

Grit Emotional Intelligence Empathy
Interpersonal Relationships Mentoring
Active Listening Resourcefulness

LANGUAGES

English
Spanish
Portuguese



ENTREPRENEURIAL EXPERIENCE

Stock-Options Trader

📅 July 2015 – Present

Self-Employed

📍 Remote

- Perform technical analysis of stock market data to develop trade rules using engineering-centered procedures.
- Code trading strategies using PineScript (programming language by TradingView) to back-test trading strategies.
- Execute buy/sell transactions, and journal and track all trades to facilitate a continuous evaluation of trading strategy results to improve system performance.

TEACHING EXPERIENCE SUMMARY

Undergraduate Courses Taught:

Course	Term	Class Size	Rating*
CAD – Adv. SolidWorks ¹	June 2021	8	-
CAD – Intro. SolidWorks ¹	April 2021	6	-
CAD – AutoCAD ¹	March 2021	12	3.59
Concurrent Design Engineering ¹	January 2021	4	4.80
Human Factors in Eng. ¹ †	December 2020	5	4.85
Design & Analysis of Exp. ¹	October 2020	7	4.95
Engineering Math. ¹	August 2020	17	3.52
CAE – Intro. MATLAB ¹	May 2020	7	4.82
CAD – Intro. SolidWorks ¹	April 2020	7	4.71
CAD – AutoCAD ¹	March 2020	17	4.72
Human Factors in Eng. ¹	December 2019	7	4.32
Statics & Strength of Materials ¹	September 2019	15	4.26
CAD – Adv. SolidWorks ¹	June 2019	7	4.80
Design & Analysis of Exp. ¹	March 2019	6	4.90
Design & Analysis of Exp. ¹	October 2018	10	4.79
CAD – Adv. SolidWorks ¹	June 2018	13	3.88
Prob. Solving & Eng. Design ²	Spring 2016	17	-
Prob. Solving & Eng. Design ²	Fall 2015	23	-

¹National University, San Diego, CA ²Pima Community College, Tucson, AZ

* Overall rating of instructor, 5 = Highest, 1 = Lowest

PROF. DEVELOPMENT & VOLUNTEERISM

Club Secretary

📅 August 2020 – Present

Improv Masters

📍 San Diego, CA / Remote

A Toastmasters Intl. Club

- Focus: Impromptu communication skills – speaking “off the cuff.”

Member

📅 March 2021 – Present

Professional Career Speakers

📍 San Diego, CA / Remote

An Advanced Toastmasters Intl. Club

- Focus: Influential communication and leadership skills – “big stage” style presentations.

Mentor / Tutor

📅 October 2019 – September 2020

San Diego Youth Services

📍 Vista, CA


Adoptions Support Services

- STEM outreach by mentoring a 12-year old aspiring robotics engineer; projects included paper airplane construction and flight testing and robotics programming (Basic Stamp microcontroller with Editor software).

CLEARANCES & CERTIFICATIONS

	SECRET Security Clearance
ISSUING ORGANIZATION	The United States Government U.S. Office of Personnel Mgmt.
REINVESTIGATION	May 2018 (valid for 10 years)
DEBRIEF	July 10 th , 2019
STATUS	Inactive; reinvestigation not required if sponsored by July 2021.

	Private Pilot
	FAA Part 61 Certificate
ISSUING ORGANIZATION	Federal Aviation Administration
DATE OF ISSUE	October 2017
RATINGS	Airplane single engine land Instrument rating <i>in progress</i>
TOTAL FLIGHT TIME	198 hours

	Lean Six-Sigma Specialist
ISSUING ORGANIZATION	Raytheon Missile Systems
DATE OF ISSUE	June 2015
LEVEL	Green belt
FOCUS	The DMAIC improvement cycle applied to manufacturing.

PUBLICATIONS

Journal Articles

- [1] E. Rodriguez et al. “Approximation of absolute surface temperature measurements of powder bed fusion additive manufacturing technology using in situ infrared thermography”. In: *Additive Manuf.* 5 (January 2015), pp. 31–39. DOI: [10.1016/j.addma.2014.12.001](https://doi.org/10.1016/j.addma.2014.12.001).
- [2] P. Frigola et al. “Fabricating Copper Components with Electron Beam Melting”. In: *ASM Int. – Adv. Mater. Proce.* (July 2014), pp. 20–24. URL: <https://www.asminternational.org/documents/10192/19735983/amp17207p20.pdf>.
- [3] C.A. Terrazas et al. “Multi-material metallic structure fabrication using electron beam melting”. In: *Int. J. Adv. Manuf. Technol.* 71 (March 2014), pp. 33–45. DOI: [10.1007/s00170-013-5449-0](https://doi.org/10.1007/s00170-013-5449-0).
- [4] E. Martinez et al. “Microstructure of Niobium Components Fabricated by Electron Beam Melting”. In: *Metallogr. Microstruct. Anal.* 2 (June 2013), pp. 183–189. DOI: [10.1007/s13632-013-0073-9](https://doi.org/10.1007/s13632-013-0073-9).

Conference Proceedings

- [5] E. Rodriguez et al. “Integration of a Thermal Imaging Feedback Control System in Electron Beam Melting”. In: *Proceed. 23rd Annual Solid Free. Fabric. Symp.* The University of Texas at Austin, Austin, TX, USA, 6–8 August, 2012, pp. 945–961. URL: <http://utw10945.utweb.utexas.edu/Manuscripts/2012/2012-72-Rodriguez.pdf>.