

Aida Yoguely CORTÉS-PEÑA

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aida@yoguely.com

EDUCATION

Georgia Institute of Technology, Atlanta, GA

2015-	M.S. MECHANICAL ENGINEERING	GPA: 3.66
2017	ENGINEER IN TRAINING (EIT) NCEES, LICENSE EIT026640, 2015	
2010-	B.S. MECHANICAL ENGINEERING	GPA: 3.67
2015	SYSTEMS ENGINEERING FUNDAMENTALS TRAINING CERTIFICATE, 2013	
	NASA STUDENT AMBASSADOR VIRTUAL COMMUNITY COHORT V, 2012	
	Study Abroad Georgia Tech Lorraine, Metz, France, Fall 2012	

EXPERIENCE

Materials and Processing Mechanical Engineering Co-op, NASA, Johnson Space Center, Houston, TX FALL 2016 ES-4 Structural Engineering Division

- Modelled the Morpheus Lander propellant tanks and analyzed stress using SALOME finite element modeling.
- Determined worst-case defects in the welds from borescope, ultrasound, and x-rays reports. Performed damage tolerance analysis using NASGRO fracture mechanics and fatigue crack growth software.
- Determined the safe-life cycles before failure and max operating pressure which enabled safe field testing.
- Initiated the execution of a long-term creep test of acrylic window material for the Orion Multi-Purpose Crew Vehicle.
- Supported the characterization of mechanical strength of composites by performing impact tests, potting, and imaging.

Graduate Research Assistant, Georgia Institute of Technology, Atlanta, GA FALL 2015 Smart Materials' Advanced Research and Technology Laboratory

- Investigated the effects of high-energy radiation exposure on the dielectric and piezoelectric response of relaxor-ferroelectric single crystals for micro-electromechanical systems (MEMS) applications.
- Processed thin films using cleanroom tools: mask aligner, spincoater, rapid thermal annealer (RTP), and unifilm sputterer. Characterized thin films using a profilometer and x-ray diffractometer (XRD).
- Performed piezoelectric force microscopy (PFM) and near-field microwave impedance microscopy (NF-MIM) on polycrystalline lead zirconate titanate (PZT) at the Oak Ridge National Laboratory.

Materials Science and Engineering Intern, NASA, Ames Research Center, Mountain View, CA SUMMER 2014 Advanced Space Science and Technology Laboratory

- Researched high specific surface area electrode materials for an electrochemical double layer capacitor (EDLC).
- Synthesized graphene oxide (GO) and multi-walled carbon nanotubes (MWCNT) using a chemical solution method.
- Modified an electrophoretic deposition (EPD) method and thermal reduction process to control the materials properties.
- Performed cyclic voltammetry, Raman spectroscopy, and Fourier transform infrared spectroscopy (FTIR). Accompanied atomic force microscopy (AFM), transmission electron microscopy (TEM), and scanning electron microscopy (SEM).
- Mentored 3 high school students in supercapacitor development and 3D printing.

Micro and Nano Engineering Intern, NASA, Marshall Space Flight Center, Huntsville, AL SUMMER 2013 Electrical, Electronic, Electromechanical Parts Engineering and Analysis Team

- Researched novel dielectric materials to create the internal barrier layer capacitor (IBLC) effect for a solid state ultracapacitor to replace batteries. Developed a synthesis profile that significantly increased the permittivity.
- Synthesized film-coated nano-particle dielectrics and characterized permittivity, loss, and equivalent series resistance.
- Conducted optical microscopy and accompanied scanning electron microscopy (SEM) inspection.
- Performed 3D additive manufacturing by using screen printing techniques to build and test a capacitor.

Failure Analysis Engineering Intern, NASA, Goddard Space Flight Center, Greenbelt, MD SUMMER 2012 Microscale Testing and Analysis laboratory

- Developed an infrared technique for materials characterization of thermal diffusivity and thermal conductivity.
- Inspected composite subsurface defects by programming tools in MATLAB for non-destructive evaluation (NDE): derivative image analysis, and thermographic signal reconstruction.
- Quantified metal brazing, adhesion debonding, and delamination of ceramic matrix composites by area fraction measurement and line temperature profiles using Image-Pro Plus.

SKILLS

AutoCAD	LabVIEW	COMSOL Multiphysics	VPython	Adobe Photoshop/Premiere Pro
Inventor	MATLAB	Siemens NX	ImageJ/Image-Pro Plus	Native English/Spanish
SALOME	NASGRO	PBASIC	PHP/HTML/CSS	Proficient French

SELECTED PROJECTS

Optimization of Moth Bipectinate Antennae

SUMMER 2016

- Worked in a team of two to create a 3D assembly model of a moth and its antennae using Siemens NX surface modeling.
- Performed 3D static analysis of the effect of wind speed on the deflection, stress, and fracture of the moth antennae using finite element method (FEM).
- Conducted a fluid dynamics parametric study to maximize drag while minimizing structure volume using 2D COMSOL simulations.

Piezoelectric Micro-electromechanical Systems (MEMS) Microphone

SPRING 2016

- Worked in a team of four to design a micro-sized microphone that can be implanted inside the ear and serve as a hearing aid for the hearing impaired.
- In charge of designing the packaging of the device which consisted of a piezoelectric pressure sensitive diaphragm. Modeled the acoustic to mechanical to electrical response using finite element method (FEM). Determined the optimal piezoelectric geometry that maximizes membrane deflection and voltage generation using COMSOL simulations.

Drill Orientation Stabilization and Feedback System

SPRING 2015

- Led a senior design team of six in designing, prototyping, and testing a hand held drill attachment that can actively help the operator maintain the correct orientation during the drilling process.
- In charge of designing the electrical system and finite state machine which consisted of a printed circuit board (PCB) and an Arduino microcontroller. Built an attachment using two reaction torque flywheels and an inertial sensor.

AWARDS

- Woodruff Fellowship, 2015
- Honorable Mention Air Products Undergraduate Research Symposium Poster Expo, 2015
- Air Products ME Undergraduate Researcher Award, 2015
- 1st place Live Action NASA Humans in Space Art Video Challenge, 2014
- 2nd place Air Products Undergraduate Research Symposium Poster Expo, 2014
- President's Undergraduate Research Award (PURA), 2014
- 2nd place NASA Marshall Space Flight Center Intern Poster Expo, 2013
- Northrop Grumman and Society of Hispanic Professional Engineers Academic Scholar, 2012
- NASA Motivating Undergraduates in Science and Technology Scholar, 2011 to 2015

COMMUNITY SERVICE

- Texas Association for Bilingual Education (TABE) Conference 2016: Supported the office of education NASA booth by speaking about NASA STEM bilingual education programs for teachers and K-12 students to over 45+ visitors.
- Find Your Career Path Expo 2016: Supported the NASA booth as part of the Hispanic Employee Resource Group (HERG). Shared my career path and my work at the Johnson Space Center with over 1000+ visiting high school juniors and seniors.
- ZeroRobotics Field Day 2016: Spoke to over 40 middle school minority students on my experiences as a NASA engineer.
- SHPE Link with a Leader Program 2016: Spoke to 25 9th grade hispanic students at the Riverwood International Charter Middle School on the topic "My career and how to choose yours."
- SHPE Link with a Leader Program 2015: Spoke to over 75 hispanic students at the Sandy Springs Charter Middle School on the topic "How do you choose a career that you will enjoy?"
- ZeroRobotics Field Day 2015: Partnered with the Space Grant Consortium and the Georgia Statewide Afterschool Network to provide a tour of the Aerospace department to over 20+ middle school students and lead a competition that teaches the principles of programming and space.
- Women in Engineering Exploring Engineering Event 2015: Provided a tour of the Nano and Micro Engineering laboratories to a dozen local high school minority students.
- 2nd Annual Latino College and STEM Fair 2014: Managed the mechanical engineering booth. Spoke to parents, middle and high school students about careers in industry and research. Presented examples of mechanical systems.
- Chestatee Academy Campus Visit 2014: Student panelist and tour guide for 30+ minority students.

ACTIVITIES/HOBBIES

- **Membership:** American Ceramic Society, Society of Woman Engineers, Society of Hispanic Professional Engineers, Women in Engineering, Robojackets FIRST Robotics, Hispanic Scholarship Fund, and Hispanic Recruitment Team.
- **Hobbies:** YouTube content creator, web developer, server administrator, DSLR photographer, blogger, traveler.

PUBLICATIONS

- [1] A.Y. Cortés-Peña, T.D. Rolin, S.M. Strickland, and C.W. Hill. “Solid state ultracapacitor to replace batteries”. In: *NASA Technical Reports Server NASA TM 2013*. Submitted. Patent pending. 2013.
- [2] Y. Bastani, A.Y. Cortés-Peña, A.D. Wilson, S. Gerardin, M. Bagatin, A. Paccagnella, and N. Bassiri-Gharb. “Effects of high energy x ray and proton irradiation on lead zirconate titanate thin films’ dielectric and piezoelectric response”. In: *Applied Physics Letters* 102.19 (2013), p. 192906.

POSTERS

- [1] A.Y. Cortés-Peña and N. Bassiri-Gharb. “Effects of high-energy radiation exposure of the dielectric and piezoelectric response of relaxor-ferroelectric single crystals”. In: *Air Products Undergraduate Research Symposium*. Poster. Apr. 2015.
- [2] A.Y. Cortés-Peña, D.H. Gutierrez, K. Tang, and B. Chen. “Electrophoretically deposited graphene oxide and carbon nanotube composite for supercapacitors”. In: *NASA Ames Research Center Intern Poster Exposition*. Poster. Aug. 2014.
- [3] A.Y. Cortés-Peña, Y. Bastani, A.D. Wilson, S. Gerardin, M. Bagatin, A. Paccagnella, and N. Bassiri-Gharb. “Effects of high energy x ray and proton irradiation on lead zirconate titanate thin films’ dielectric and piezoelectric response”. In: *American Ceramic Society Electronic Materials and Applications*. Poster. Jan. 2014.
- [4] A.Y. Cortés-Peña, T.D. Rolin, S.M. Strickland, and C.W. Hill. “Solid state ultracapacitor to replace batteries”. In: *NASA Marshall Space Flight Center Intern Poster Exposition*. Poster. Aug. 2013.
- [5] A.Y. Cortés-Peña, J. Jones, and M. Viens. “Infrared flash method for non-destructive evaluation of materials”. In: *NASA Goddard Space Flight Center Intern Poster Exposition*. Poster. July 2012.
- [6] A.Y. Cortés-Peña, Y. Bastani, S. Gerardin, M. Bagatin, A. Paccagnella, and N. Bassiri-Gharb. “Effects of high energy x-rays and proton irradiation on ferroelectric thin films”. In: *International Workshop on Acoustic Transduction Materials and Devices*. Talk and Poster. May 2012.