

## JESSICA A. ARTILES

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### EDUCATION

Massachusetts Institute of Technology

Cambridge, MA | 2008-Present

Dual Masters of Science Candidate, September 2015

M.S. *Department of Mechanical Engineering*

M. S. *Technology and Policy Program*

Teaching Certificate Program by The Teaching & Learning Lab

Bachelor of Science, June 2012

*Department of Mechanical Engineering | Energy Minor | Environmental Public Policy Concentration*

#### RELEVANT COURSES:

*[How to Make \(Almost\) Anything](#); [Machines that Make](#); [Product Design](#); *Engineering Design for Sustainability*; *Advanced Measurement & Instrumentation*; *Energy Markets & Decisions*; *Systems Visualization*; *Fundamentals of Photovoltaics*; *Energy, Materials, & Manufacturing*; *Java Language Programming**

#### RELEVANT SKILLS:

*Software:* Adobe Suite, SolidWorks, Java, MATLAB, MathCAD, SimaPro, GaBi, CoolVent, PHOENICS, LaTeX

*Hardware:* computer-controlled cutting, electronics design and production, 3D scanning & printing, computer-controlled machining, molding and casting, embedded programming, composites, input devices, output devices, networking and communications, interface and application programming, mechanical design, machine design

*Languages:* Native in Spanish and English; Beginners' Level of Italian, French; Fluent in Portuguese

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### RESEARCH EXPERIENCE

MIT Computer Aided Design Laboratory

MIT, Cambridge, MA | 2012-Present

*Research Assistant for Professor David R. Wallace*

*Master's Thesis: Sep. 2015*

- Re-interpreted Design Thinking and the Design Process in order to re-imagine the education system
- Designed two flagship experiments in the application of design thinking to education systems, the [Education Designathon](#) and the [Education Designshop](#), and re-iterated through these many times
- Optimized the process of innovation for teams working to re-design the education system by condensing product design principles into 2-day modules of learning and doing
- Replicated the DesignShop in Belo Horizonte, Brasil, using local middle school students as design reviewers

MIT Energy Initiative

Madrid, Spain | Summer 2012

*Grid Flow Data Analyst for Prof. José Ignacio Pérez Arriaga*

- Compiled database of US energy: load; solar, wind, and hydro resources; cost metrics; non-renewable generation
- Extracted information to fit as model inputs. Interpolated across data agencies to produce coherent network of hourly flows
- Moderated mission objectives of modeling team with available data to achieve desired projections of future energy grid

MIT Material Systems Laboratory

MIT, Cambridge, MA | 2010-2012

***Grid Emissions Researcher for Prof. Randolph Kirchain & Prof. Frank Field***

- Manage product's Life Cycle Analysis and GHG emission records data in SimaPro; Assess electric grid contributions to carbon footprint
- Intermediary in team of research scientists, manufacturing employees, and marketing directors in different tiers of production
- Lead product teardowns to run Monte Carlo simulations and use materials inventory for LCA impact assessment of computer monitors

**Massachusetts Climate Change Adaptation**

**MIT, Cambridge, MA | Spring 2010**

***Policy Adaptation Negotiation Designer for Prof. Larry Susskind***

- Developed multi-stakeholder role-play simulation ('game') to advance local efforts in climate change adaptation
- 'Game' prepares participants for conflicting political, economic, and social constraints in the context of high scientific uncertainty

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**INDUSTRY EXPERIENCE**

**Estácio de Sá, Departamento de Inovação,  
*Design Thinking Consultant***

**Rio de Janeiro, Brasil | Summer 2014**

- Applied design thinking methods for the betterment of the new Innovation Department in the largest private university in Brasil, including adaptation of tablets and a start-up incubator in-house
- Taught staff members through a design thinking workshop focused on their organizational principles
- Presented in panel at CONITEC 2014, the National Conference on Corporate Innovation, Work, and Education

**Secretary of Education's Office, Schools of Tomorrow Initiative  
*Design Thinking Consultant***

**Rio de Janeiro, Brasil | Summer 2014**

- Applied design thinking methods for inclusion in the framing of the largest public school district in Brasil
- Taught staff members through a design thinking workshop focused on their organizational principles

**U.S. Department of Energy, Chief Financial Office, Risk Management  
*Engineering Intern***

**Washington, D.C. | Summer 2011**

- Researched supply and demand of critical rare earth materials used in new thin film photovoltaic cells. Used sensitivity analysis for the supply of rare earths required for the sustainable implementation of thin film technology in the United States
- Identified savings of \$50B in risk-based models for clean up to radioactive tank waste remediation project. Analyzed human health and environmental impacts associated with various retrieval options and presentations to senior management

**Navigant Consulting, Inc.  
*Energy Consulting Intern***

**Burlington, MA | Winter 2011**

- Analyzed 99 DOE-funded Smart Grid Investment Grant Projects Build Metrics across six topic areas of implementation
- Consolidated data reports with technical functionality and assessment of project impacts into all-encompassing database

**Havas Media  
*Global Intelligence Intern***

**Barcelona, Spain | Summer 2010**

- Introduced Industrial Ecology concepts to marketing and strategy team to be taught throughout company
- Applied concepts to new marketing strategy covering 16 industries to meet consumer demands of sustainable goods

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## PROJECT EXPERIENCE

### [How to Make \(Almost\) Anything](#)

MIT, Cambridge, MA | Fall 2014

#### *Designer & Maker*

- Bootcamp class for manipulating analog into digital, and vice versa
- Built 14 different projects at a rate of one skill and project per week
- Final project: A toy for our house chef that notifies residents when food is ready

### [Hyperdrive System Assembly](#) for 5Wits Entertainment Studios

MIT, Cambridge, MA | Spring 2014

#### *Product Designer*

- Collaborated with a team of 5 to design a fun, immersive, and interactive game for a sci-fi adventure
- Design attention to user experience storyboards, concept sketches, sketch models, and refined concept models. Machining attention to hot wire cutting, vinyl cutting, horizontal bandsaw, mill, lathe.

### Design Across Scales

MIT, Cambridge, MA | Spring 2014

#### *Designer & Maker*

- MIT Media Lab course exploring design at different scales of personal and technological engagement: [Design a Representational System](#); [Design Something that Helps you Make Something](#); [Design a Game](#)
- Key lab skills practiced: Digital Documentation, 2-Dimensional Representation, 3-Dimensional Representation, Data Visualization with Processing, Fabrication (Rapid Prototyping & Advanced), Robotics

### [Helmet Hub](#)

MIT, Cambridge, MA | Fall 2011

#### *Product Developer, Patent Application 14/322613*

- Worked with team of 12 to build helmet dispenser that integrates with bike share programs; Position of key motivator for chosen idea
- Design attention to brainstorming, mock-up builds, community integration, and graphic presentations. Machining attention to mill, lathe, bandsaw, and waterjet; Product in development for market penetration

### Material Constraints for Thin-Film PV

MIT, Cambridge, MA | Fall 2011

#### *Model Analyst*

- Produced a multi-scenario analysis of restrictions for thin-film PV materials, including mineral requirements, mineral production, mineral production growth rates, and mineral end use competition

### [Re-design of the Charcoal Making Process](#)

Totogalpa, Nicaragua | Spring 2010

#### *Culture & Technology Interpreter, Engineer*

- Lived and worked with community partners in rurals of Nicaragua to improve charcoal making: burning agro-waste in oil barrel at close range with high risk of tipping over
- Specific attention to user needs, resource availability, physics of process, and technology transfer; Final design adopted by community

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## TEACHING & EDUCATING

### MIT Development-Lab Design

Spring 2015

#### *Teaching Assistant*

- Advised 6 student teams through the creative capacity building model of the design process and principles
- Supported course assessment and evaluation techniques and feedback mechanisms for students

### [MIT D-Lab Education](#)

Fall 2014

### ***Re-Designer & Co-Instructor***

- Re-designed hands-on, interdisciplinary course to include 3 main strands: Toy Product Design; Design of Curricular Content for K-12 children; Deployment in Developing Countries
- Co-Developed course milestones and delivered content through lecture and lab activities

### **MIT Teaching Certificate Program**

**Spring 2014**

- Completed a theoretical and practical study of pedagogy, curriculum, and methods

### **MIT 2.00 Introduction to Product Design**

**Fall 2014**

#### ***Instructor***

- Advised 5-person team through their first introduction to product design process and principles
- Guided students through ideation and machining process for two project milestones: user-centered, and product-centered

### **MIT 2.009 Product Engineering Processes**

**Fall 2013, 2014**

#### ***Mentor***

- Advised 20-person team through their senior capstone project-based course
- Facilitated class and lab meetings to provide insight on the process of product design and incorporating design thinking into their developmental approach

### **MIT 2.00b Toy Product Design**

**Spring 2013**

#### ***Instructor***

- Advised 5-person team through their freshman exploratory course on toy product design
- Led lab meetings for maximum exposure to product design process and design thinking, whilst learning tangible engineering skills to take into their undergraduate years

### **MIT X.7682 How-to: Professional Looking Makeup**

**Fall 2013**

#### ***Course Designer and Teacher***

- Designed first ever make-up course for Splash, a weekend of classes at MIT for high school students
- Delivered hands-on curriculum parsing material into color theory, brush stroke technique, and practical tips

### **Student Platform for Engineering Education Development (SPEED)**

**2013-Present**

#### ***Implementation Competition Designer***

- Designed first-ever online Implementation Competition to encourage continuation and execution after the GSF
- Created monthly milestones for student teams to be on track to a competitive entry 6 months after the GSF

### **Student Platform for Engineering Education Development (SPEED)**

**2012-Present**

#### ***Education Content Designer & Instructor***

- Guided 80+ international students in the 9<sup>th</sup> Global Students Forum (GSF) in Cartagena, Colombia to create Action Plans
- Assembled content, lesson plan, slides, activities, format for 3-day crash course introduction to the design process to be applied to their engineering communities
- Liaised with professional topic experts and student facilitators to best deliver mentorship to students' activities and frustrations throughout the experience
- Invited to present and instruct on design process for the first National India Student Forum (NISF)

### **MIT 8.02 Electricity and Magnetism**

**Spring 2009**

#### ***Teaching Assistant***

- Taught, tutored, and facilitated experiments for undergraduate physics class

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## LEADERSHIP

### (1<sup>st</sup> ever!) MIT Mini Maker Faire

2014

#### *Operations Officer*

- Planned logistical operations for 130 exhibitors and over 3,000 attendees to “the Greatest Show & Tell on earth”
- Liaised with MIT administration and organizing team of 20+ students

### The Possible Project

2014-2015

#### *Venture Advisor*

- Mentored high school students through their first start-ups using technology to affect their communities

### MIT Energy Conference

2010-2011

#### *Content Organizer*

- Directed format, content, and logistics for expert panelists in Grid 101 Workshop and Demand Response Panel

### **MIT Office of Admissions**

2009-Present

#### *Admissions Ambassador*

- Serve as MIT Admissions representative; Establish personal connections between prospective students and MIT community
- Transformed recruitment program from \$5,000 annual budget to \$75,000 alumni-funded endowment

### **Sigma Kappa Sorority**

2008-2012

#### *Various Re-Elected Officer Roles*

- Triangle Correspondent; Membership Recruitment Leader; Intra Mural Sports Chair; Inner Social Co-Chair
- Managed \$15,000+ budget & delegated interests of 120+ members

### **MIT Casino Rueda Group**

2009- 2010

#### *President, Choreographer*

- Nation-wide renowned dance group; Led bi-weekly workshops; Consecutive invitations to perform in annual Boston Salsa Congress

### **The Humane Foundation 501(c)3**

2007-2008

#### *Co-Founder, President*

- Conceptualized and directed events and meetings in the community; collaborated with professional partners, locally and globally
- Expanded grassroots effort into Greater Miami area; prepared groundwork for establishment as a non-profit foundation

### **Belly Dance Performance Group**

2005-2007

#### *Co-Founder, Choreographer*

- Taught dance choreography to 20+ high school students; provided structure for students in need of after school care
- Placed 1<sup>st</sup> and 2<sup>nd</sup> in annual talent competition within first two years of formation

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## HONORS & PUBLICATIONS

- MIT Graduate Woman of Excellence** Cambridge, MA | 2015  
Nominated and selected for contributions to the MIT community
- Fab11, Annual Festival** Cambridge, MA | August 2015  
Workshop Accepted: *Unlocking the Potential of Fab-in-a-box: A portable Fabrication Lab for Children and Makers Everywhere*
- American Society of Engineering Education** Seattle, WA | June 2015  
Paper Accepted for Technical Presentation: *Ta-Da! You're a Design Thinker! Validating the DesignShop as a model for Teaching Design Thinking to Non-Designers and Achieving Systemic Re-Design in the Education System*
- Harvard LearnLaunch Conference** Cambridge, MA | 2015  
Workshop, *What is coding code for? Design thinking to achieve meaningful computing for youth and you*
- MIT Presidential Advisory Cabinet** Cambridge, MA | 2014  
Elected Representative and Liaison to the Office of the President  
Created new infrastructure for student voice, representation, and transparency
- MIT Committee on Undergraduate Admissions & Financial Aid** Cambridge, MA | 2014  
Elected Graduate Student Representative
- Stanford FabLearn Conference** Stanford, CA | 2014  
Paper Accepted for Oral Presentation: *Methods for Innovation: Observations from the Education DesignShop*
- 10<sup>th</sup> Design Thinking Research Symposium** Purdue, IN | 2014  
Designated invitee to synthesize and analyze conference developments
- National Indian Students' Forum** Hubli, India | 2014  
Design Process for Implementation, Advisor
- International Conference on Transformations in Engineering Education** Hubli, India | 2014  
Paper Accepted for Oral Presentation: *The Education Designathon and the Education Designshop: Adapting Design Thinking for Innovating in the Education Space*
- World Engineering Education Forum** Cartagena, Colombia | 2013  
Paper Accepted with Oral presentation: *Borrowing from Hackathons: Overnight "Designathons" as a template for creative idea hubs in the space of hands-on learning, digital learning, and systems re-thinking*
- Total Company Conference: Summer School** Paris, France | 2011  
One of 120 worldwide invitees
- MIT Energy Poster Scholar** Cambridge, MA | 2011  
Presented at annual MIT Energy Night; Mentored incoming class of scholars
- Community Catalyst Leadership Program Fellow** Cambridge, MA | 2010  
Elected for personalized, yearlong mentorship to enhance methods and practices
- LeaderShape Fellow** Cambridge, MA | 2009  
Chosen for weeklong retreat in leadership's best practices
- Science, Engineering, Communications, and Mathematics Enhancement (SECME)** Miami, FL | 2007  
Robotic/Bionic Hand Challenge: Most Realistic Prosthesis Award; Best Presentation Award