

MARIANNA COULENTIANOS

Design Science

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EDUCATION

Ph.D. Design Science (September 2020)

College of Engineering, University of Michigan

Dissertation title: **The use of prototypes to engage stakeholders in design for low- and middle-income countries**

Dissertation advisors: Prof. Kathleen Sienko (Mechanical Engineering),
Ass. Prof. Achyuta Adhvaryu (Business Economics)

Master of Applied Economics (expected May 2020)

College of Literature, Science, and the Arts, University of Michigan

M.S. Product Design and Innovation (2016)

Laboratory of Design and Innovation

Arts et Métiers Paristech, School of Mechanical Engineering

Thesis title: *"Good practices in the digital transformation of large retail companies: User-Center Design"*

Master of Engineering (2016)

Arts et Métiers Paristech, School of Mechanical Engineering

AWARDS AND FELLOWSHIPS

National Science Foundation Graduate Research Fellowship Program

(2017-2020)

Michigan student leadership for innovation and research award (2020)

University of Michigan

Student Activist Award (2018) University of Michigan

Design Science Fellowship (2016-2017) University of Michigan

Silver medal of honor (2017) Arts et Métiers Paristech

RESEARCH PROJECTS

Utilizing renewable energy sources to dry wastewater sludge and create a sustainable biomass – 2019-Ongoing funded by the US NSF and DoE

Methods: Designed a system to salvage waste heat from spent nuclear fuel to dry wastewater sludge. Conducted design research with 50+ stakeholders, synthesized feedback, and iterated on the design.

Outcomes: Currently iterating on system design, planning on disseminating through academic publications.

Requirement elicitation interviews of medical practitioners with or without prototype(s) – Accra and Kumasi, Ghana (2016)

Methods: Interviews of medical practitioners, based on prototypes for task-shifting contraceptive implant removal devices, thematic coding of transcripts

Outcomes: Results suggest stakeholders need to visualize a device during interviews, the presence of prototypes leads to novel requirements elicited but may bias responses

Medical device industry practitioners' early design processes for stakeholder engagement with prototypes in the Global Health industry (2017-2020) funded by the US NSF

Methods: Semi-structured interviews with industry practitioners, thematic coding of transcripts

Outcomes: Visual and analytic framework of strategies, stakeholders, prototypes, and settings leveraged by practitioners

Mobility and socio-cultural constraints to increase the labor force participation of women in rural India – North Karnataka, India (2017-2020)

Methods: Design ethnography (interviews, observations, insight synthesis), pilot testing, piloting of a Randomized Controlled Trial

Outcomes: Technical report of findings and collaboration with industry partner to create job opportunities in rural areas and scale the RCT to several villages

Electronic waste recycling workers' preferences for safe and effective tools – Khon Kaen, Thailand (2019-2020)

Methods: Conjoint analysis, Becker-DeGroot-Marschak auction method, interviews, baseline and endline surveys

Outcomes: Design and manufacturing of an improved tool for electronic waste recycling, ongoing analysis of outcomes from tool usage

Redesign of digital tools for front-line workers in Carrefour mass retail stores – Paris, France (2016)

Methods: Applied user discovery, personas, and journey mapping; organized co-creation workshop; developed service blueprints and rapid prototypes

Outcomes: Redesigned a digital tool for front-line workers and developed a technical report for the digital transition

RESEARCH SKILLS

Qualitative research methods: interviewing, observations, qualitative data coding and analysis

Quantitative research methods: conjoint experiment, willingness-to-pay experiment, randomized controlled trial

Field work experience in low- and middle-income countries:

2 months in Ghana, 4 months in India, 1 month in Thailand

RELATED PROFESSIONAL SKILLS

Project management (Gantt, Agile Methods, Airtable)

Statistical software (R, Stata)

Qualitative analysis (Nvivo)

Adobe Creative Cloud (Illustrator, InDesign, Photoshop)

Microsoft Suit (Excel, Word, PowerPoint)

PUBLICATIONS

Journal publications (published and in review)

Global health front-end medical device design: using prototypes to engage stakeholders. Coulentianos, M. J., Rodriguez-Calero, I., Daly, S.R., Sienko, K.H., 2020. Journal of Development Engineering.

Stakeholders, prototypes, and settings of front-end medical device design activities. Coulentianos, M.J., Rodriguez-Calero, I., Daly, S.R., Burr ridge, J., Desimone, L., Sienko, K.H., in review. International Journal of Design.

Effects of product representation in choice experiments on stakeholder preference elicitation in a low-resource setting. Coulentianos, M.J., Chou, S., Arezoomand, M., Adhvar yu, A., Austin-Breneman, J., Sienko, K.H., in review. Journal of Development Engineering.

Conference publication

Stakeholder perceptions of requirements elicitation interviews with and without prototypes in a cross-cultural design setting, Coulentianos, M. J., Daly, S.R., Sienko, K.H., 2020, in: Proceedings of the ASME 2020 IDETC & CIE Conference. St. Louis, MO, USA.

Stakeholder engagement with prototypes during front-end medical device design: who is engaged with what prototype? Coulentianos, M. J., Rodriguez-Calero, I., Daly, S.R., Sienko, K.H., 2020, in: Proceedings of the 2020 Design of Medical Devices Conference. MN, USA.

Medical Device Design Practitioner Strategies for Prototype-Centered Front-End Design Stakeholder Engagements in Low-Resource Settings, Coulientianos, M.J., Rodriguez-Calero, I., Daly, S.R., Burrridge, J., Sienko, K.H., 2019, in: Proceedings of the Design Society: International Conference on Engineering Design. pp. 957–964. <https://doi.org/10.1017/dsi.2019.101>

L'intégration du design centre utilisateur dans la conception de nouveaux outils numériques, une bonne pratique dans la transition numérique des entreprises de grande distribution. Coulientianos, M.J., Jean, C., Aoussat, A., Recorbet, C., 2016. Presented at the 23eme Colloque des Sciences de la Conception et de l'Innovation, Prague, République Tchèque.

Second author publications

Chou, S., Arezoomand, M., Coulientianos, M.J., Nambunmee, K., Neitzel, R., Adhvaryu, A., Austin-Breneman, J., 2020. The stakeholder agreement metric (SAM): quantifying preference agreement between product stakeholders, in: Proceedings of the ASME 2020 IDETC & CIE Conference. St. Louis, USA.

Rodriguez-Calero, I., Coulientianos, M.J., Daly, S.R., Sienko, K.H., 2020. Single versus multiple prototypes: medical device design practitioners' rationale for varying prototype quantities to engage stakeholders during front-end design, in: Proceedings of the 2020 Design of Medical Devices Conference. MN, USA.

Rodriguez-Calero, I., Coulientianos, M.J., Daly, S.R., Burrridge, J., Sienko, K.H., accepted. Design practitioners' strategies using prototypes for stakeholder engagements in front-end design activities. *Design Studies*.

TEACHING EXPERIENCE

Graduate Facilitator, Center for Socially Engaged Design,

University of Michigan (2019 - Ongoing)

Tailored lecture development and facilitation, student mentoring

Examples: *'Intro to Human Centered Design'*; *'Requirements and Specifications'*; *'Idea generation'*; *'Prototyping for feedback'*, *'Prototyping and Material Selection'*

Lead Graduate Academic Liaison, Ginsberg Center for Community Service Learning, University of Michigan (2017 - Ongoing)

Workshop facilitator and project manager for community partner voices initiative: amplifying university partners' perspectives in service learning
Eight workshops per semester (e.g., *'Entering, Engaging, and Exiting Communities'*; *'Identity, Power, and Privilege in Design'*)

PROFESSIONAL MEMBERSHIPS

Engineering for Change
American Society of Mechanical Engineers
Design Society

ADDITIONAL TRAINING

National Science Foundation Engineering Design Research Methods

Summer School (2017), Clemson University, South Carolina

Design Kit: The Course for Human-Centered Design (2018), Acumen MOOC

Design Kit: Prototyping (2018), Acumen MOOC

Green Entrepreneurship (2020), Learning for Nature MOOC

SERVICE

Co-founder DISE graduate group: Design for Impact, Sustainability and Equity (2019 – Ongoing)

Telluride Association Board Member, a scholarship co-op centered on intellectual inquiry, democratic self-governance, and service (2017 – Ongoing)

Chair of the Logistics Committee

Volunteer at the Peace Neighborhood Center and Food Gatherers

Volunteer refugee host for Samaritas Organization (2018 – Ongoing)

Host newly arrived refugees for the first few months in the country to help them get settled

LANGUAGES

English – native C2

French – native C2

Spanish – (B1-B2) intermediate comprehension, speaking, reading, writing

Greek – (B1) intermediate comprehension and speaking, basic reading and writing

RECOMMENDERS

Prof. Kathleen Sienko, Mechanical Engineering, (734) 647-8249,

sienko@umich.edu

Ass. Prof. Achyuta Adhvaryu, Business Economics and Policy, (734) 615-2327,

adhvaryu@umich.edu

Additional recommenders can be provided upon request

Marianna Coulentianos