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Nomadic Monument for Women in Robotics


Diedra Krieger
diedrak@seas.upenn.edu

Gaby Alfaro
University of Pennsylvania, gangulo@seas.upenn.edu

Joey Hartmann-Dow
Us & We Art, usandweart@gmail.com

Sonia F. Roberts
University of Pennsylvania, soro@seas.upenn.edu

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Nomadic Monument for Women in Robotics

Abstract

We describe the Nomadic Monument for Women in Robotics (NMWR), a project celebrating women pioneers in robotics. NMWR is a 13' semi-transparent geodesic dome with illustrations and descriptions of the women and their research on the inside faces of the triangles. Visitors can see rough outlines of the illustrations from the outside, but must enter the dome to learn about the women. As an immersive environment, the dome provides visitors not only a place to learn about inspiring women but also a space to feel that they are a member of this inspiring community.

The geodesic dome was introduced by Buckminster Fuller in the mid-20th century as a new form for human shelter that would be more environmentally friendly and affordable, made possible by new building materials and the innovative use of tension to hold a built structure together. Simple facts and diagrams about dome geometry are included on dome. Fuller's domes have also had a lasting influence on artists, including Krieger. Her 11-year ongoing project Plastic Fantastic engages community members in building a geodesic dome out of 6000 post-consumer water bottles, with notable installations at the Anchorage Museum in 2014 and Philadelphia's inaugural Art in the Open in 2010. The NMWR dome will be constructed out of PVC piping and light blue, red, and purple panels of acrylic.

A range of living women roboticists, many with a connection to Philadelphia, are featured in the dome. They work on a variety of problems in modern robotics, including helping give robots a sense of touch (Katherine Kuchenbecker, formerly at Penn); programming groups of robots to work together (Daniela Rus, MIT); sensing devices with medical applications (Ruzena Bajcsky, founder of the GRASP Lab at Penn); designing robots to move around in and collect information about harsh environments like Mars and Antarctica (Ayanna Howard, Georgia Tech); developing technologies (including robots) to assist in caring for children or the elderly (Maja Mataric, University of Southern California), and many more.

The portraits and descriptions of these women challenge stereotypes about who can be an engineer, and the presentation of Hartmann-Dow's near life-sized portraits at eye level around the inside of the dome creates a space for visitors to enter the community of women roboticists. Stereotype challenge and the sense of belonging to a community have both been shown to influence interest in engineering by women and girls (for a review, see [1]).

NMWR will be presented at the 2018 Philadelphia Science Festival and will be on view at three events throughout the festival: At the Screening of Top Secret Rosies on Friday, April 20; at the Be a Pennovator event on Sunday, April 22; and at the Science Carnival on Saturday, April 28. The first two events will be at the Pennovation Center, and the last will be on the Parkway.

[1] Cheryan, Sapna, Sianna A. Ziegler, Amanda K. Montoya, and Lily Jiang. "Why Are Some STEM Fields More Gender Balanced than Others?" *Psychological Bulletin* 143, no. 1 (2017): 1.

For more information: [Kod*lab](#).

Keywords

STEAM, STEM, robotics, art, women in STEM

Disciplines

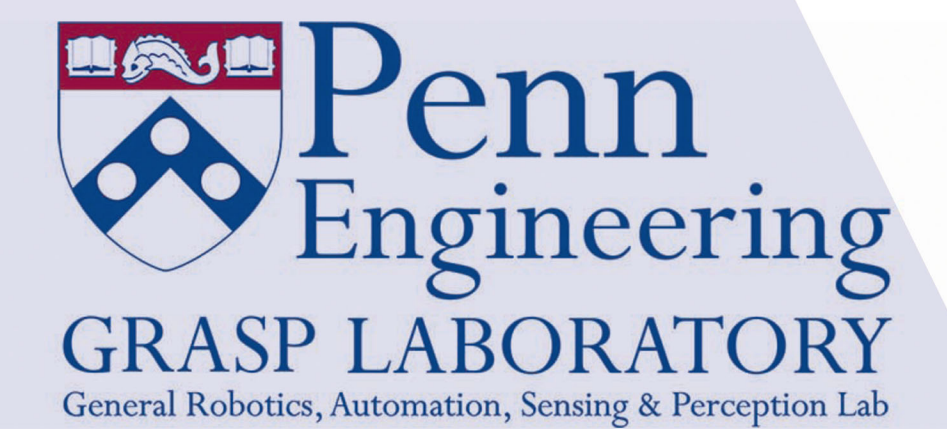
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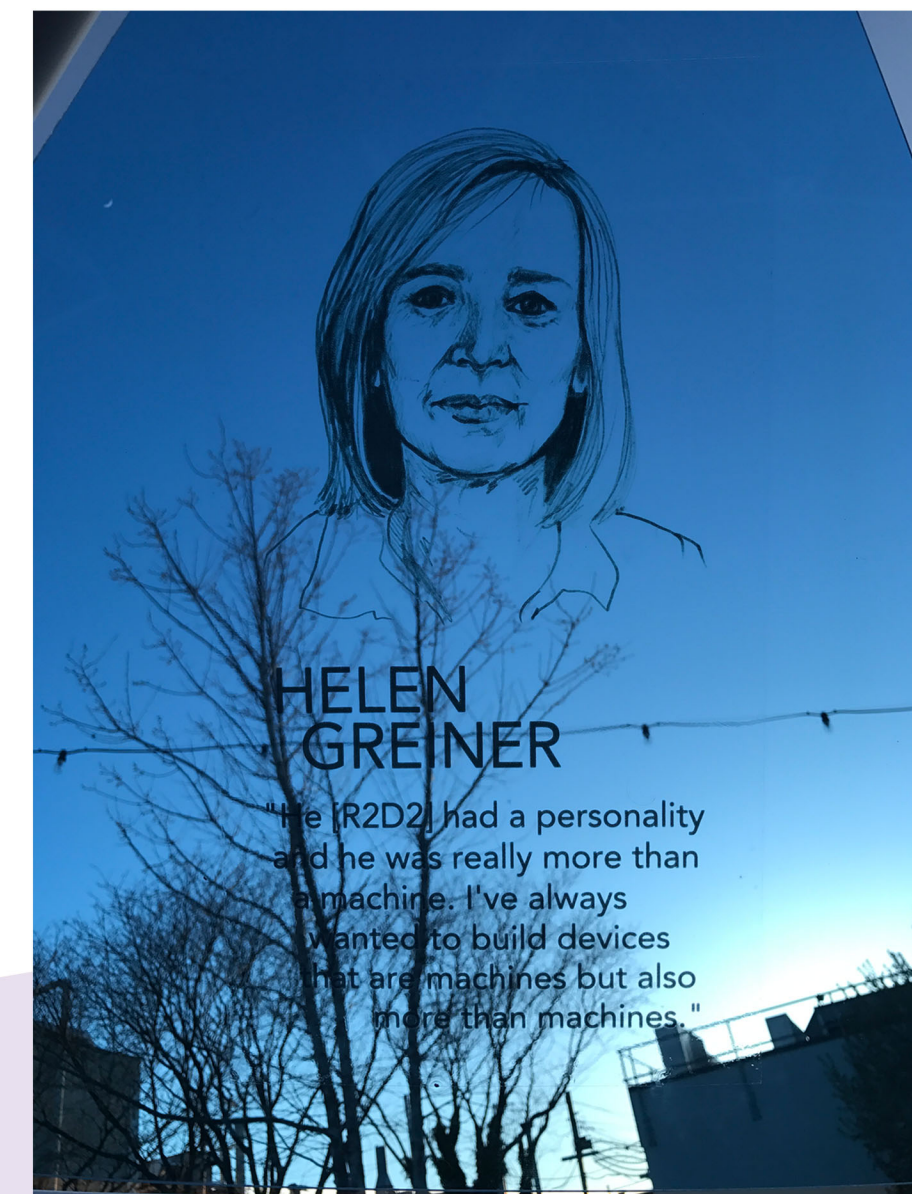
Nomadic Monument for Women in Robotics

Authors: Diedra Krieger^{1,2}, Gaby Alfaro², Joey Hartmann-Dow³, Sonia Roberts²

1. Plastic Fantastic; 2. University of Pennsylvania; 3. Us & We Art



The Nomadic Monument for Women in Robotics, designed by Krieger and Alfaro for the Philadelphia Science Festival, celebrates the innovations of eight women pioneers in the field of robotics. Its goal is to create a community of women eagerly inviting aspiring pioneers to join them when entering the dome [1]. The portraits and descriptions of women roboticists challenge stereotypes about who can be an engineer, allowing young girls to start developing a sense of belonging in an informal STEM learning environment. Hartmann-Dow's near life-sized portraits at eye level around the inside of the dome create a space that allows for visual connection between the visitors and the roboticists. Visitors can read quotes of key moments or experiences that made them become pioneers in their field. Stereotype challenge, sense of belonging to a community, and having same-gender role models correlate with interest in engineering by women and girls [2][3].



13' geodesic dome made of PVC piping, zipties and semi-transparent light blue, red, and purple 1/8" acrylic triangles. Interior features illustrations of and quotes about their inspiration and research by women pioneering roboticists

Dome attributes:

13' diameter, 36 triangles dome creates an immersive environment for visitors, especially suited for middle school aged youth

Portraits of women pioneers in robotics at eye level creates symbolic community

Featured women roboticists were chosen partly based on their connections to Philadelphia to make it site-specific

Krieger uses the strategy of the dome structure for social relations in her 11-year ongoing project, Plastic Fantastic

VISIT THE MONUMENT!

Join us tomorrow,
 Sunday 4/22/18, 11am-2pm
 at "Be a Pennovator"
 hosted by the GRASP Lab and
 the Pennovation Center,
 3401 Grays Ferry Ave,
 Philadelphia.

Roboticists and their quotes describing inspirational moments



RUZENA BAJCSY

"We do not only see, we look we do not only touch, but we feel. I made this statement into an engineering agenda."

Professor of Electrical Engineering and Computer Science, University of California, Berkeley



DANIELA RUS

"My father encouraged me to learn to program in high school and taught me Boolean algebra. From there, I knew I wanted to study computer science in college..."

Professor of Electrical Engineering and Computer Science, MIT



HELEN GREINER

"He [R2D2] had a personality and he was really more than a machine. I've always wanted to build devices that are machines but also more than machines."

Cofounder of iRobot, CTO of CyPhyWorks



HADAS KRESS-GAZIT

"[A Robot is] something that can create some physical motion in its environment, it has the ability to change something in the world around you."

Associate Professor, Mechanical and Aerospace Engineering, Cornell University



AYANNA HOWARD

"I quickly saw that, if I could combine the power of AI with Robotics-- I could enable the ambitious dreams of my youth."

Professor and Chair of the School of Interactive Computing in the College of Computing, Georgia Tech



LYDIA KAVIRAKI

"Robotics is at a very interesting crossroad. It has the potential to impact our lives in a positive way and I want to be part of this positive change."

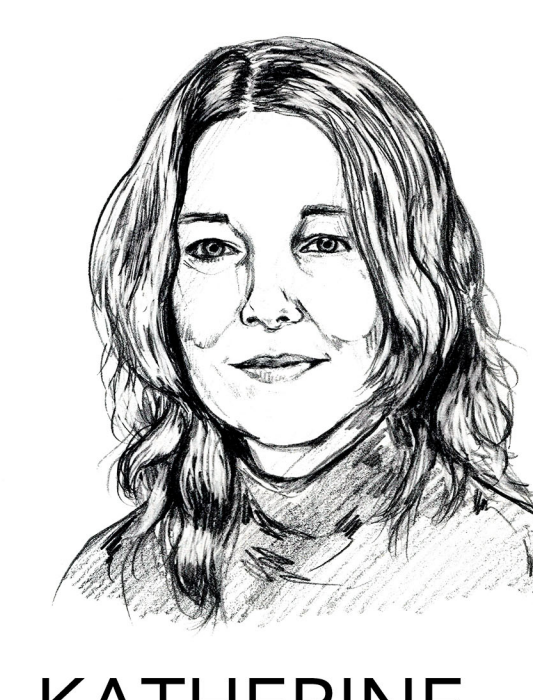
Professor of Computer Science, Rice University



LYNNE PARKER

"I am drawn to AI because I wonder how we are so smart and figure things out quickly, yet our brains are so slow compared to typical computers."

Professor of Computer Science, Associate Dean of the Tickle College of Engineering, University of Tennessee



KATHERINE KUCHENBECKER

"Life is a lot more than just what you see and what you hear. You can't do anything in the real world without reaching out and touching something."

Director and Scientific Member at the Max Planck Institute for Intelligent Systems, Stuttgart, Germany

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