



Mozilla

Mozilla Research Grants 2018H1

View on Screendoor at <https://mozilla-research.forms.fm/mozilla-research-grants-2018h1/responses/BGijtYloxDsg>

Name

Pamela Wisniewski

Email

pamwis@ucf.edu

If your proposal is funded, what's a phone number with country code we could use to text you?

18144410937

If you receive funding, we'd like to be able to publicize the award in various ways. What's your twitter handle?

pamwis

What university, research institute or charitable organization are you affiliated with?

University of Central Florida

What department or institute are you in?

Department of Computer Science

What's the URL of your research group, or department?

<http://www.cs.ucf.edu/STIR/>

What city, state (if applicable) and country do you mainly work in?

Orlando, FL

What's the highest degree you hold?

bachelors degree

masters degree: M.S., M.Eng, M.A., M.F.A., M.Arch, etc.

✓ doctoral degree: Ph.D, M.D., J.D., etc.

Are you a...

Undergraduate student (note: we will likely not fund any requests from undergraduates)

Masters student

Ph.D student

Postdoctoral student

1st or 2nd year new faculty

✓ Other untenured faculty and/or assistant professor

Other tenured faculty and/or associate or full professor

research scientist

Please upload your CV or resume, in PDF format

- Wisniewski_Mozilla_WoT_CV.pdf (153 KB)

<https://screendoor.dobt.co/attachments/oBYIKLiCrBYe96xYKqo40En4bFV8onts/download>

Do you identify your gender as...

- ☐ Male
- ☒ Female
- ☐ Trans*
- ☐ Prefer not to disclose

What's the title of your project?

A Community-based Approach to Co-Managing Privacy and Security for Mozilla's Web of Things

Describe what you're going to do in this project. Make sure you show how your work builds upon other work, and make clear the particular contribution of your project.

Pamela Wisniewski (PI), University of Central Florida, pamwis@ucf.edu; Jessica Kropczynski (Co-PI), University of Cincinnati, jess.kropczynski@uc.edu

Introduction

Mozilla's Web of Things provides a unique opportunity to explore the viability of a community-based approach to co-managing privacy and security in environments where physical devices are linkable and discoverable on the web. We will apply a model of community oversight as a mechanism for supporting individuals' privacy and security practices through increased transparency and awareness that allows trusted members of a community to provide relevant information, feedback, and assistance to help one another navigate the complexities of managing the privacy and security of individuals and internet-connected devices. Many examples demonstrate how community oversight strengthens security and safety in the physical world – from parents watching over each other's children on the playground to neighbors alerting one another when a strange vehicle is near a home at an odd time. In many cases, these mechanisms have been formalized into programs that facilitate oversight, such as neighborhood watch programs that became popular in the U.S. during the 1980's as a way for ordinary citizens to exercise control within the communities in which they live. Such mechanisms have yet to be translated between the physical (e.g., smart home IoT devices, such as video cameras, door locks, garage door openers, and security systems) and digital (e.g., user interface privacy settings) domains in a way that facilitates the co-management of IoT devices connected to the web. Mozilla's Web of Things provides a unique, open source platform to explore this opportunity.

Applying a Model of Community Oversight

In conjunction with Dr. Heather Lipford from UNC Charlotte, we developed a model of community oversight as part of a NSF SaTC Small grant that was recently recommended for funding. This model draws upon broader research from the social sciences, including collective efficacy, citizen participation in problem-solving, community organizing, and proactive or preventative measures against risk. The NSF SaTC proposal will apply this model within the context of mobile smart phones; in contrast, this work proposes conducting formative and summative research studies to assess whether community oversight can also be an effective model for helping users co-manage both their digital (i.e., web-based) and physical (i.e., home) privacy and security using Mozilla's Web of Things.

Proposed Work

Our main goal is to understand the dynamics of groups or social networks that could benefit from community oversight and to design a viable solution to operationalize transparency, awareness, and participation for co-managing digital and physical privacy and security for the Web of Things. We will accomplish this goal through two research phases, as described below.

In Phase 1, we will conduct a formative evaluation of users' needs to understand their current and potential patterns of information sharing as it relates to the Web of Things. Our goal is to understand the types of groups that could potentially utilize community oversight, such as whether they are closed groups (e.g., neighborhoods) or more similar to a social network (e.g., friends and family), and properties of the relationships between group or network members. Using a web-based survey via Qualtrics (www.Qualtrics.com), we will explore the existing topography of users' social infrastructure that supports their digital and physical privacy and security practices on a large scale.

In Phase 2, we will leverage the Web of Things' open source API to develop and summatively evaluate an initial prototype based on Phase 1 outcomes. We will operationalize the concepts of transparency, awareness, community, and individual participation from our model of community oversight into privacy and security settings for co-managing in-home (and around home) IoT devices via Mozilla's Web of Things. We will then conduct a user study within trusted dyads or small groups (e.g., neighbors, friends, or family-members) and assess the viability of and collective efficacy for co-managing one's digital privacy and security settings for the Web of Things, as well as one's physical privacy and security within one's home, using our proposed solution. Mixed quantitative and qualitative approaches will be used to analyze the results of the user study. After disseminating our findings within the HCI research community, we will release the source code for our project, so that other can build upon our initial efforts.

Research Team

Dr. Pamela Wisniewski (PI) is an Assistant Professor in the Department of Computer Science at the University of Central Florida. Her research expertise lies at the intersection of social computing and privacy. Her goal is to frame privacy as a means to not only protect end users, but more importantly, to enrich online social interactions that individuals share with others. Her research work with adolescents has won best paper awards (top 1%) and best paper honorable mentions (top 5%) at ACM SIGCHI.

Dr. Jess Kropczynski (Co-PI) is an Assistant Professor in the School of Information Technology at the University of Cincinnati. She is a sociologist utilizing theory and methods to examine collective action in community networks, and the design of civic technology. She has also worked with local and state governments to assess communication and information needs of target audiences in order to promote informed decision-making around community issues.

What are the metrics for your success? How will you, and we, know if you have succeeded or failed?

Success will be measured in a number of ways. First, feedback from participants (N=100) in Phase 1 will provide a formative understanding of the problem space, as well as a deeper understanding of the needs of end users. This knowledge will be embedded in the prototype developed in Phase 2. Second, a summative evaluation of whether our instantiation of our model for community oversight was successful will be conducted with users (N = 20). Success will also be measured by our work being published in high-quality, peer-reviewed venues (such as CHI or CSCW). Additionally, success will be measured by users downloading and extending the open source code for the prototype built in Phase 2.

Mozilla's mission is to ensure the Internet is a global public resource, open and accessible to all. Our Mission, and our Manifesto, is at <https://www.mozilla.org/en-US/mission/> How does this project contribute to that mission?

As the Internet of Things becomes more integrated into our daily lives, we will need to find effective ways to manage our privacy and security when interacting with and through these internet-enabled devices. We believe taking a community-based approach that relies on existing trust networks will be a superior model to relying on crowdsourced recommendations from an aggregation of unknown others, ensuring that social networks and communities help one another to ensure a safe and accessible internet (even if through "Things") for all.

How will you collaborate with Mozilla through the course of this grant? What's your plan for getting the results of your research into academia, into Mozilla, and in to the rest of the world?

We are committed to collaborating closely with Mozilla. For example, Dr. Wisniewski's student would be interested in interning with Mozilla in conjunction with completing the proposed work. We would invite Mozilla researchers to collaborate and submit scholarly work to academic conference, such as CHI and CSCW. Dr. Wisniewski also has a strong track record of engaging with news media to disseminate the results of her work more broadly to the general public. Another opportunity may be to participate in UCF's NSF I-Corps site to develop the prototype into a minimal viable product and conduct more in-depth customer discovery. A future grant proposal to NSF's Partnerships for Innovation (PFI) between the PI, Co-PI, their collaborators, and Mozilla would also be of great interest.

Which Mozilla employee has agreed to champion this project internally, to make sure it has impact within the company? Each Mozilla employee can generally only champion one project per funding cycle.

Kathy Giori

What's the email address of your Mozilla champion?

kgiori@mozilla.com

Please ask your Mozilla champion for one paragraph of text explaining why we should fund this project, and paste it here.

Dr. Pamela Wisniewski has suggested a very interesting research proposal that seems quite beneficial to our Web of Things implementation. She has proposed to research the value of improving upon Mozilla's decentralized IoT framework by enabling an extension of that framework for communities or family and friends to share, and therefore group, some of the visibility and analysis of their collective data.

For example, in my neighborhood we "keep an eye out" for each other's homes, especially while our neighbors are on vacation. We could instead be given access to monitor key security data from each other's homes. This would be helpful also for a family that is typically out of the house entirely during the day. Other neighbors who aren't always away could be given access during certain hours, to receive "unexpected entry" or other alerts from the homes of their neighbors.

If you are not a faculty member or equivalent, please upload a maximum two-page letter of recommendation from your advisor confirming their support for this project.

No response

How much money are you requesting?

\$50000.00

Please give us a short budget explaining what you intend to use the money for.

\$31,117 for Dr. Wisniewski to support one Ph.D. student for one year; \$15,000 for a sub-award to the Co-PI Dr. Kropczynski at University of Cincinnati to hire hourly students to support the project and to offset some travel expenses; \$1,400 for participant honorariums costs (Phase 1 = 100 participants * \$10 gift cards; Phase 2 = 20 participants * \$20 gift cards); \$1,283 for travel to disseminate results at academic conferences; \$1,200 for hardware (IoT devices) for the Web of Things prototype for Phase 2.

If you'd be interested in being informed about future grant opportunities from Mozilla, click here.

Yes