Overview of Citizen Science

**Introduction**

Citizen science is “the involvement of the public in scientific research – whether community-driven research or global investigations" (CitizenScience.org, 2020). Citizen science is a collaborative approach between scientists and volunteers. This approach helps build support from local communities and stakeholders (The Guardian, 2020).

Projects are typically led by academic, government, non-profit, and professional scientists. The project leaders define the goals for the research, define the research methods and data analysis, and set up the research project. The scientists make end-user technology and platforms, such as mobile applications and websites, available to the public. Citizen science projects depend on volunteers to collect and submit data from local environments. Citizen science projects tap into the power of crowd-sourced observations and data collection from people spread across a geographic location.

**Scope of Citizen Science Projects**

Citizen science projects study a wide range of environmental and natural phenomena, such as bird migration, orca whale behavior, air pollution, and water resources. There is a plethora of citizen science projects around the world. Some of the large organizations who coordinate and amplify citizen science projects are National Geographic, Citizen Science, and Citizen Science Global. See:

* National Geographic: <https://www.nationalgeographic.org/idea/citizen-science-projects/>
* Citizen Science Global: <http://citizenscienceglobal.org/>
* Citizen Science: <https://www.citizenscience.gov/>
* European Commission – Science Hub: <https://ec.europa.eu/jrc/en/science-update/science-citizen-science>

On smaller scales, there are projects motivated by a community’s desire to connect with others and improve local conditions. For example, a local hiking club can monitor and communicate trail conditions in real-time to help people who use the trails for hiking, mountain biking, and sight-seeing.

In essence, citizen science involves observing, questioning, planning, analyzing, and communicating (Figure 1). processes seen in Figure 1 below.

Shape

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Figure 1: Processes involved in citizen science (Image source: CA Academy of Sciences – Citizen Science Toolkit)

Technology plays a part in all these processes to support what the scientists and volunteers want to accomplish. There are front-end tools in the form of websites and mobile applications whose primary users are the volunteer citizens collecting and submitting data. There are technology tools used by the scientists and research teams to manage the data and perform data analysis.

**Conducting User-Centered Design on Citizen Science**

Citizen science is a compelling theme for user-centered design because it involves multiple stakeholder groups, a variety of front-end technologies (e.g., web and mobile), and information architecture. User-centerer design focuses on particular domain comprising people, activities, context, and technology. For this class, our over-arching domain is citizen science, and your team will scope this down to a particular citizen science project. For assignments, by “domain,” we are referring to your chosen citizen science project, composed of the following:

1. The natural or environmental focus of citizen science research (e.g., seabirds in the Pacific Northwest.)
2. The scientific research and goals (e.g., monitoring the health of beach birds)
3. The specific project conducting crowd-sourced scientific research (e.g., Seattle-area COASST).

**Explorations in Citizen Science HCI Capabilities and Technology**

Citizen Science is powered by technology used by the public to learn about the initiative, collect and upload data, review data, interact with aggregated data, and build community. These technologies typically include websites, mobile applications, and embedded communication technologies (e.g., notifications, messaging, and online forums). These community activities and end-user technologies are the basis for our UCD exploration.

The HCI capabilities and features of these technologies include:

* + Web reporting
  + Smartphone apps
  + Data downloads for analysis
  + Upload bulk data
  + Dashboard
  + Management tracking (track over time)
  + Interactive maps
  + Outreach to communities
  + Educational resources (handbooks, tools)
  + Data analysis tools

**Examples of Citizen Science UCD Project for Class**

The following projects are well-suited for our UCD class because the (1) initiatives are active, (2) the technology is publicly available, and (3) the initiatives have wide range appeal. The latter criteria is important because it means you are likely to find people in your networks who are good candidates for your research.

1. Cloud Science initiatives (e.g., [GLOBE Observer Clouds](https://observer.globe.gov/do-globe-observer/clouds))
2. Light and noise pollution (e.g., [Globe at Night](https://www.globeatnight.org/))
3. Pollinator Citizen Science (e.g., tracking bee populations)
4. Bird conservation (e.g., [The Cornell Lab of Ornithology](https://www.birds.cornell.edu/home/citizen-science-be-part-of-something-bigger/))
5. Monitoring invasive species
6. Citizen Science for automobile traffic monitoring

**References**

1. CitizenScience.org. Retrieved 12/29/2020 from <https://www.citizenscience.org/>
2. The Guardian. "The Rise of Citizen Science: Can the Public Help Solve Our Biggest Problems." Retrieved Dec 29, 2020 from <https://www.theguardian.com/education/2020/nov/16/the-rise-of-citizen-science-can-the-public-help-solve-our-biggest-problems>