

Realizing AI for Impact: Towards Participatory Human-AI Collaboration for Water Conservation and Reproductive Health

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My research interests are focused on use-inspired work in artificial intelligence for social impact, in which I develop novel techniques in the fields of **multi-agent systems and machine learning** for domains ranging from conservation to public health. Currently, I focus on the domains of water conservation and reproductive health.

My commitment to developing AI for social impact has led me to concentrate on a cycle with four components:

- **Analyzing Real-World Data:** I develop methods to collect and analyze real-world data, especially remotely-sensed imagery. I draw on methodological approaches, including **computer vision and machine learning**, to address challenges with uncertainty, such as noise and limited data. I will particularly emphasize the domain of water conservation, and highlight my past work in public health and wildlife conservation (Khan et al. 2024; Bondi-Kelly et al. 2023; Gordon et al. 2023; Bondi et al. 2020a).
- **Multi-agent Reasoning:** I build on the above data and techniques to better inform multi-agent interventions. My main methodological focus is on **multi-agent systems**, especially **game theory, multi-armed bandits, and reinforcement learning**. For example, I have conducted studies on strategically deploying limited resources in conservation, such as park rangers and remote sensors (Bondi et al. 2020b; Venugopal et al. 2021).
- **Human-AI Collaboration:** Because these systems are almost always used by humans, I analyze ways to support **human-AI collaboration** to improve joint performance (Bondi et al. 2022; Balloli, Beery, and Bondi-Kelly 2024).
- **Deployment:** Finally, I am committed to deploying systems in the real world. I have built systems to facilitate such **deployment** in collaboration with domain experts, and have conducted research on **participatory AI**, which involves developing and deploying AI systems with interested and impacted communities (Bondi et al. 2018, 2021). I will also refer to ongoing work in water conservation (Khan et al. 2024) and reproductive health (Google Academic Research Award and work in preparation).

References

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