Problem and Industrial Relevance

The use of generative AI such as Large Language Models (LLMs) have exploded in recent years, as well as Machine Learning across a range of tasks. However, LLMs typically use text-based input, which does not work for or stimulate all users in all contexts. Text input keyboards don't lend themselves to in-situ collaboration.

Therefore... can tangible interaction be used to bridge interaction between data input and LLM output and create a novel method for information discovery?

Answering this question:
- Opens ML and AI to other audiences or new contexts
- By combining different types of AI/ML models and interaction modalities we may synthesize new ways for users to discover and engage with information

Contributions and Applications

- Advancing research on tangible interaction with AI
- Explore how AI and humans can collaborate
- System with range of applications:
  - Public outreach for wildlife centers
  - Citizen Participation
  - Land management
  - First responder scenarios like wildfires and disaster relief

What Follows / Evaluation Plan

- Implement Object Permanence for reliable tracking
- Connect input data to LLM
- Add annotation function

Deploy prototype with small group of people and document their usage, cataloguing:
- what data they uncovered
- what LLM returned
- what users annotated
- when they used the system
- what positions and movements the interface makes

Executive Summary

1. A system that empowers users to tangibly interact with real time video, extract information using Object Detection and generate new information and query that information using a Large Language Model.

2. Robots enable both human input and system response, facilitating a tangible collaboration between human and AI and dynamic layout and adjustment of information.