

TinyML for Social Impact



Promising Applications of TinyML



Wildlife conservation



Agriculture

Benchmarks v. Social Impact

Benchmarks

- Model accuracy
- Inference speed
- Energy consumption

Social Impact

- Complex field studies
- Time-consuming feedback loops and iteration
- Difficulty measuring impact or effectiveness of an intervention

Implementation

Effectiveness does **not** guarantee uptake!



Integrating a solution into practice:

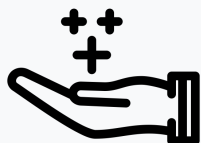
- **Determinants**—what features of the context impact uptake?
- **Strategies**—what tactics can be employed to increase uptake?

End-to-End ML Workflow



- Understand the **technical** *and* **social** elements
- Stakeholder participation, collaboration and feedback

Beneficence



Act for the **benefit of others**, help them further their important and legitimate interests, prevent or remove possible harms

How should we **allocate** those benefits?

- **Maximize** the total expected benefits across individuals?
- Give **priority** to the worst-off individuals?

Challenges and Opportunities



Lack of sufficient **data**

Need for **low-cost hardware**



Connectivity issues

Energy **efficiency**

