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Towards TinyML Solutions for Extreme Heat Sensing for Urban Climate Science

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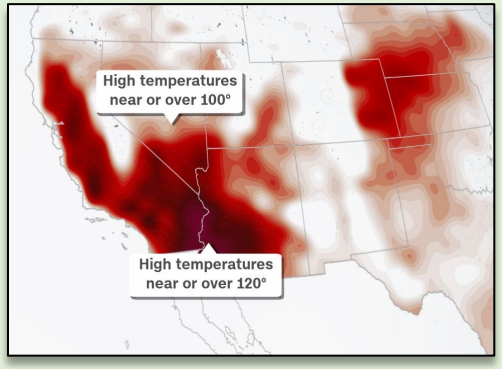
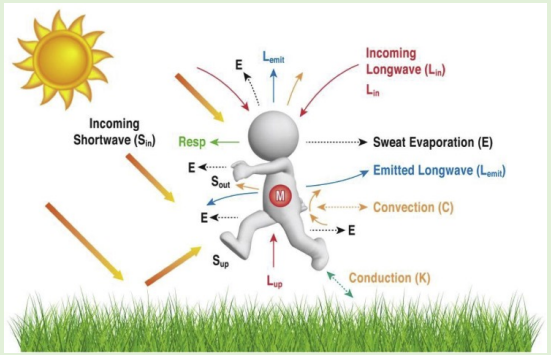
Problem Statement:

Extreme heat is getting worse

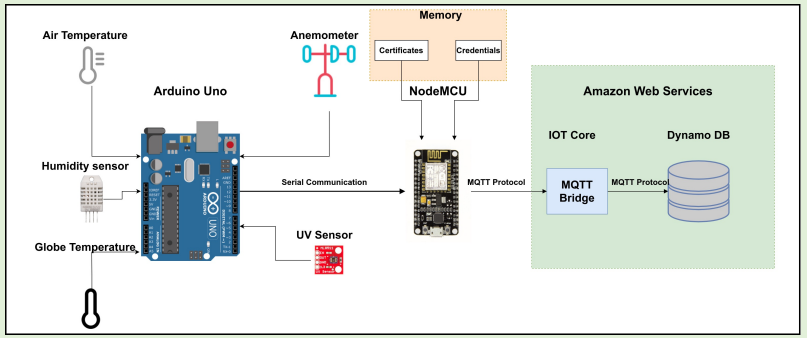


Measure: Mean Radiant Temperature and how it affects humans (it's not just temperature!)



tinyML solution:

MaRTiny: Low-cost mobile platforms for biometerological sensing
(reduced cost from $20K to $200!)



Additional functionalities: embedded computer vision to detect shade usage by pedestrians

Impact: Climate, health, urban design

- Urban infrastructure can increase heat (urban heat islands) and mitigate heat (vegetation, urban form, materials). Sensing can help provide feedback and information for infrastructure as well as health warnings
- Initial impact: Deploy MaRTinies in the city of Tempe, AZ in local parks, measure heat behaviors for extended period of time (one month). Inform the city of Tempe of outdoor space usage.

HEAT IS LEADING CAUSE FOR WEATHER-RELATED MORTALITY IN THE US

Call to Action:

- Next steps: How can heat sensors be coupled with health risk analysis to provide feedback for cities and pedestrians?
- Challenges: (1) how to influence policy and urban infrastructure? (2) how to communicate data and health risks to the general public, especially to underprivileged groups who are most at risk?
- HELP NEEDED: tinyML solutions can help improve technology, make heat sensing cheap and ubiquitous. TinyML community can help spread awareness about climate change and its effects on people's health, impact on cities