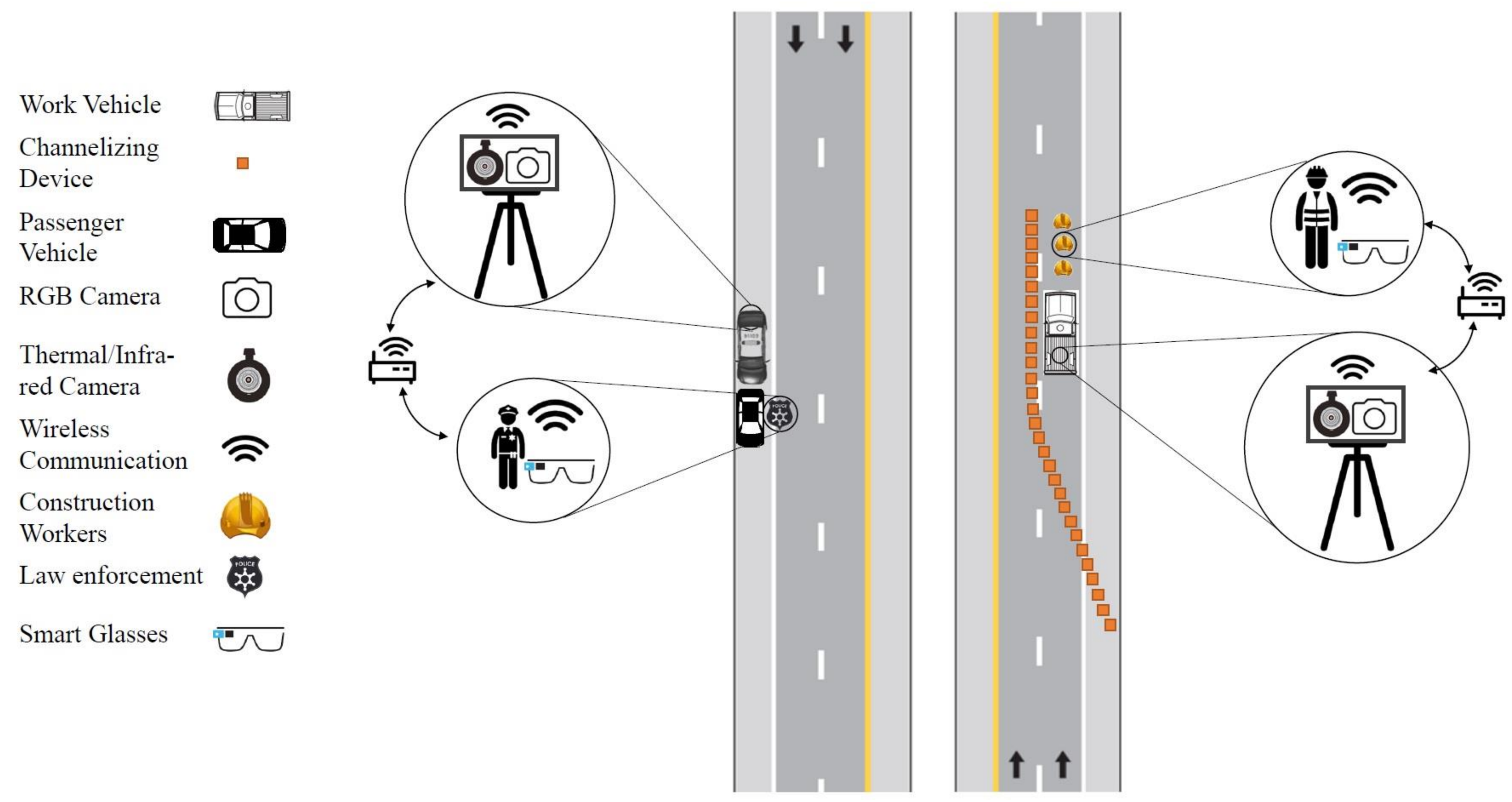
CPS: Small: Worker-in-the-loop real time safety system for short-duration highway work zones

Hamed Tabkhi, Omidreza Shoghli, University of North Carolina at Charlotte

https://coefs.uncc.edu/htabkhiv/research/nsf-cps-workzonesafety/



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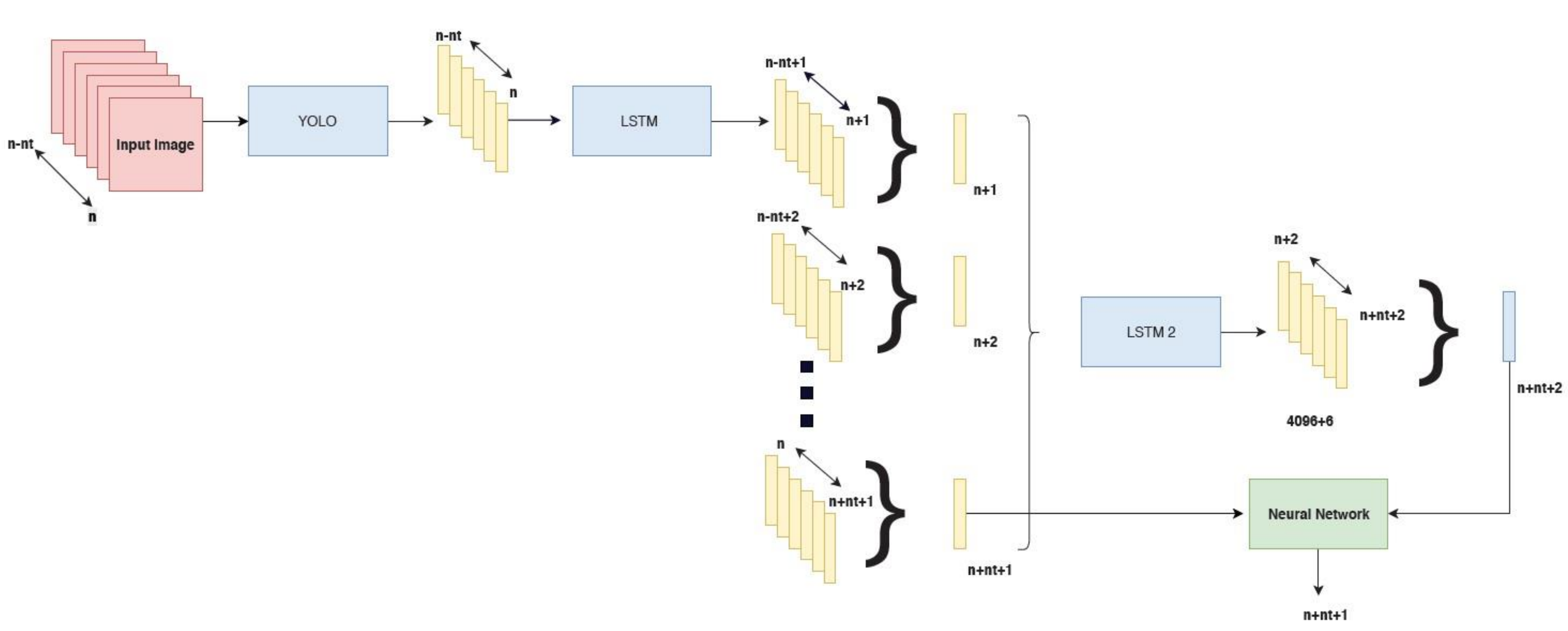
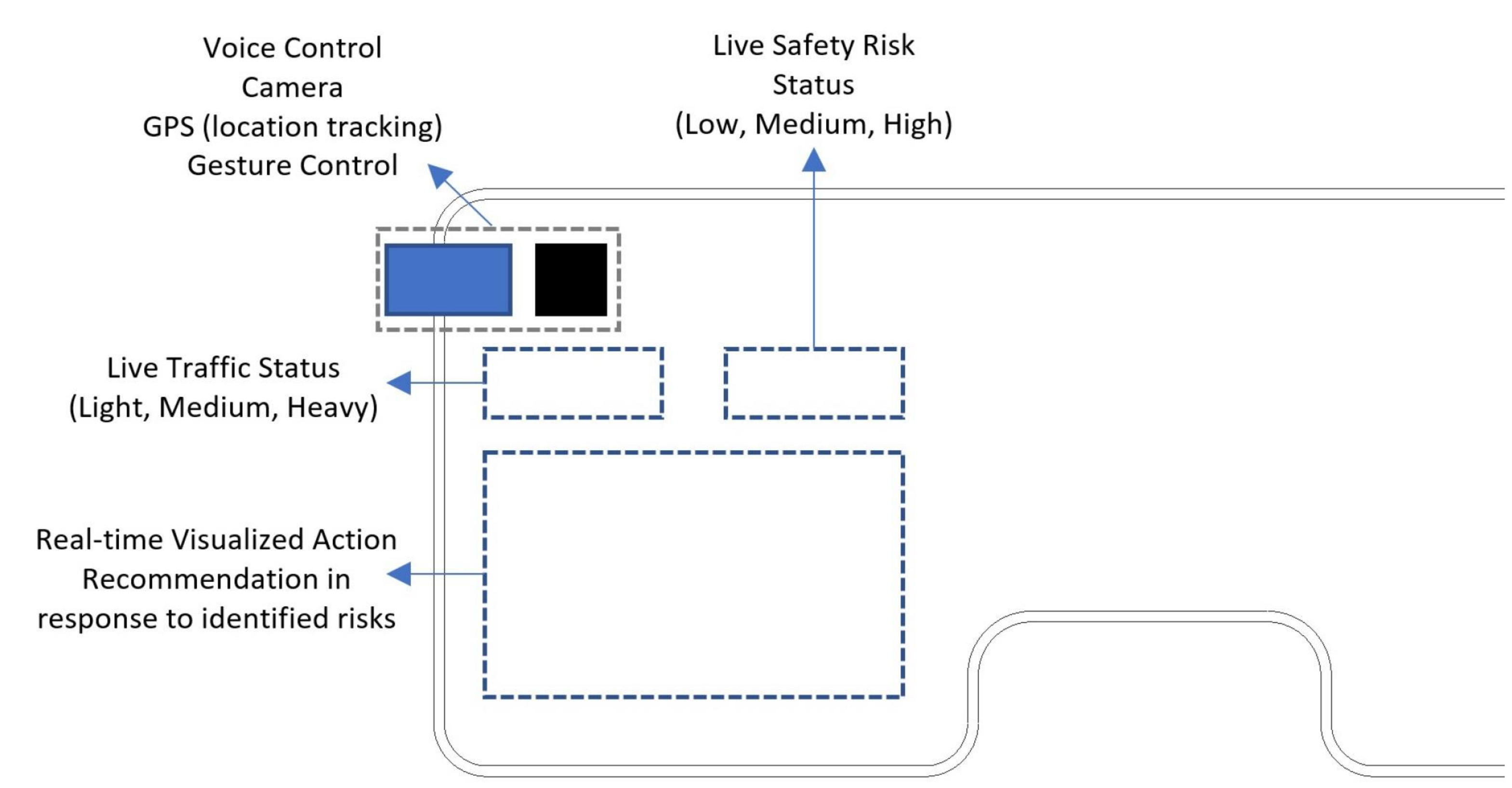
Key Challenges:

- Highway work zones expose workers to several safety risks
- In 2016 a total of 158,00 crashes occurred in work zones in US resulting in 42,000 injuries and 687 fatalities (FHWA Reported)
- Lack of proactive technologies to enhance the situational awareness of highway workers
- More pronounced in short-duration work zone due to lack of proper safety mechanisms

Scientific Impacts:

- Novel worker-in-the-loop real-time safety system which relies on the real-time data analytics for proactive alarming of the workers in the field
- Real-time deployment of visual tracking and analysis of driving behaviors in highway work zones
- Novel algorithmic constructs combined with scalable architecture and system-level frameworks for a real-time sensor fusion processing at the edge
- Smart glasses for real-time alarming/notification





Impact on Society

- Will create extensive engagement of highway workers to co-design and co-create the technology
- Will make collaboration with leading industries in highway maintenance
- Will create real-world testbed of technology for multiple short duration highway work zones

Education and Outreach

- Will develop novel courses on real-time AI and augmented reality systems for safety applications
- Already engaging undergraduate students (through senior design projects)
- Will demonstrate the benefits of AI and technology to broader Charlotte community (e.g. “AI for All” course for K 8-12 students

Impact on Highway Work Zone Safety

- Departure from re-active to proactive AI-powered safety systems
- Will make short-duration highway work zones much safer for workers
- Would eliminate more than 90% of causalities in short-duration highway work zones

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