

EAGER: A Cloud-assisted Framework for Improving Pedestrian Safety in Urban **Communities using Crowd-sourced Mobile and Wearable Device Data** Award #1637290, Award Start Date: July 15, 2016 PI: Murtuza Jadliwala, Wichita State University **Co-PI: Jibo He, Wichita State University**

Challenge

To improve pedestrian safety in urban communities through *accurate* and real-time detection of distracted pedestrians and providing timely and usable hazard alerts/notifications to all concerned users.

Scope

Existing schemes for human activity recognition:

- are unable to detect several complex distraction-related pedestrian activities. • are *computationally heavy* and not feasible for implementation and use on mainstream mobile and wearable devices.
- Do not operate in *real-time* or may require *specialized hardware*.

Evaluation Plan

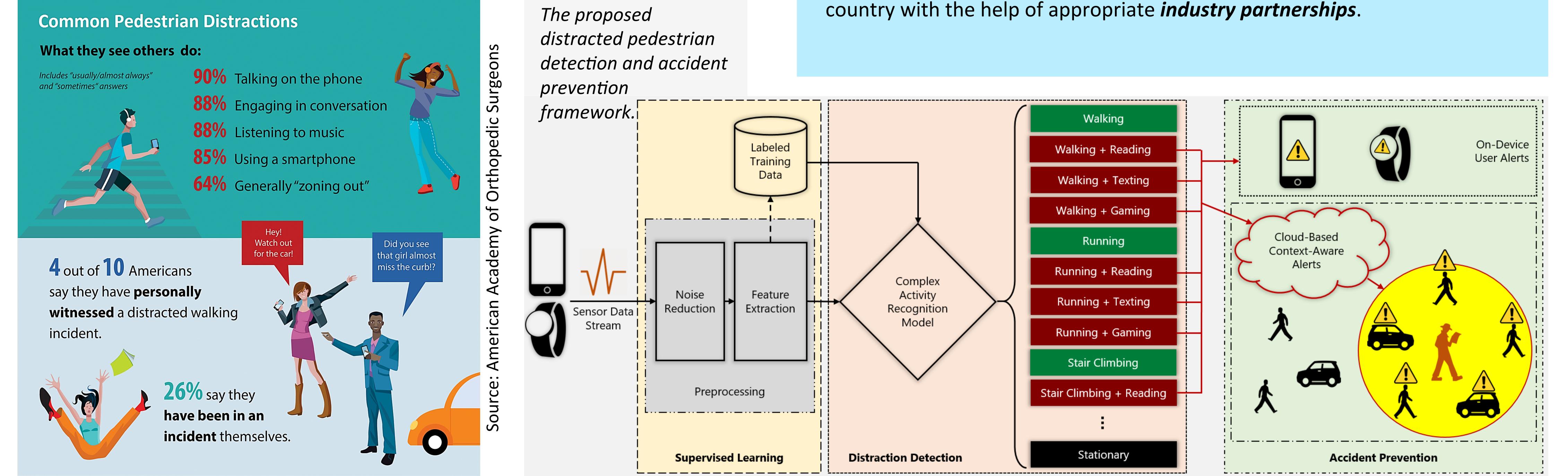
- Initial performance evaluation by *comparing* with *generic complex activity* recognition models.
- Extensive analysis of the framework with the help of a *campus-wide test*bed.

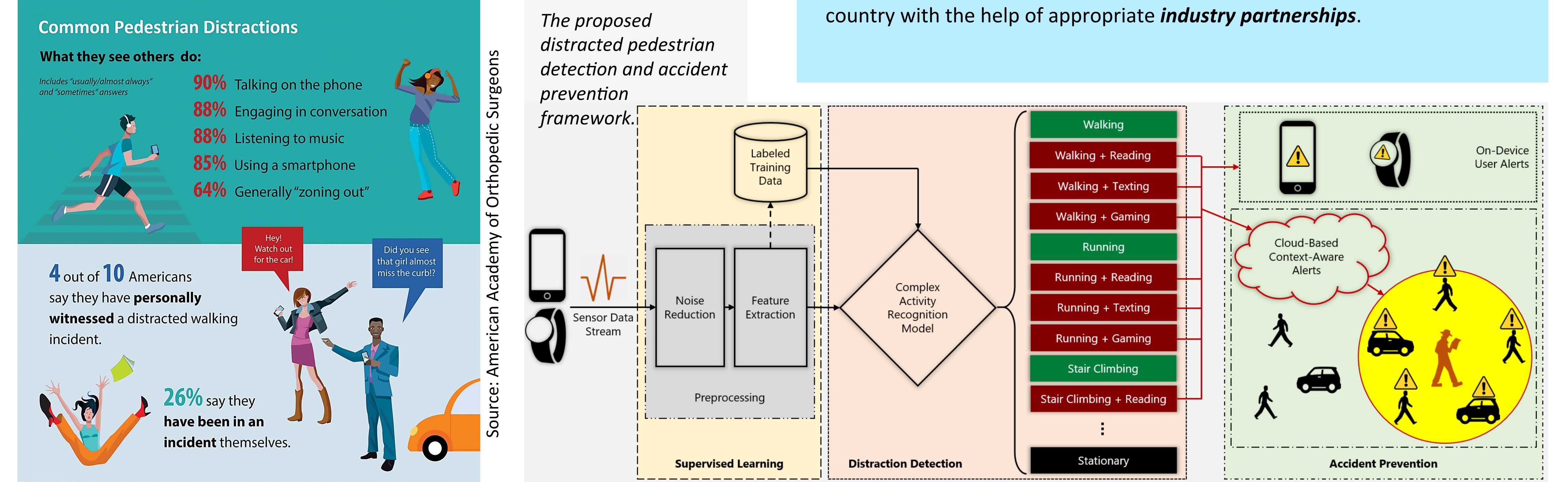
Scientific Impact

- Advancements in the field of *real-time and on-device complex activity recognition* targeted towards identifying engrossed and distracted user behavior by utilizing *multi-modal* and *multi-source* sensor data from mobile and wearable devices *with limited computational resources*.
- Extensive human factors study on *effective*, but non-disruptive, *methods*

Solution

- A novel pedestrian distraction detection framework based on an efficient hierarchical complex activity recognition model, utilizing real-time dominant frequency matching techniques.
- **Privacy-preserving** and **context-aware** cloud-based service for alerting the distracted pedestrian, and others in the vicinity.





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Broader Impact

- Reduce/Prevent distraction related injuries and *promote pedestrian well-being*, both at the user and community level.
- A *prototype mobile/wearable app* that will promote pedestrian safety in Wichita State University and the neighboring urban community.
- Deployment of the project outcomes in urban communities across the

