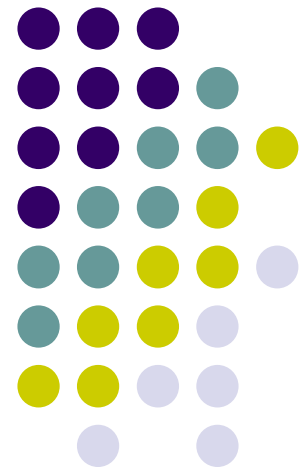


Computer Science MQP Interests 2020-2021

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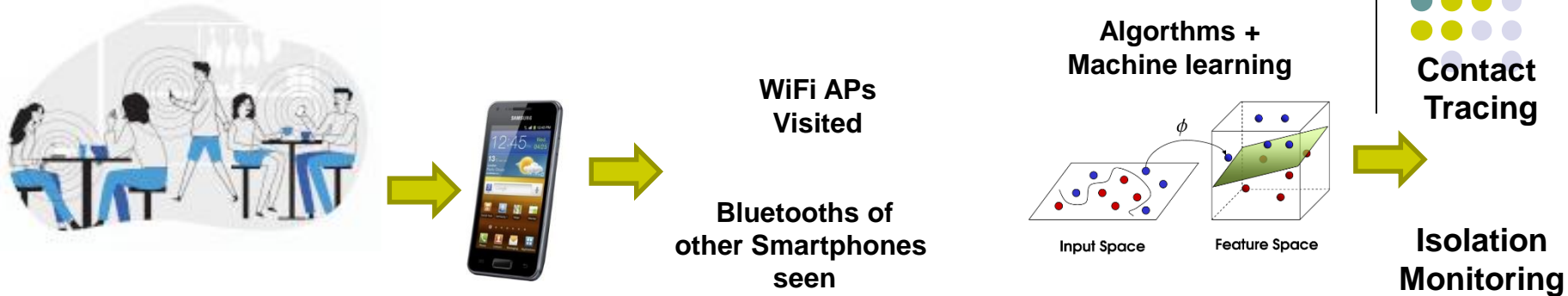


General Areas of Interest

- Intelligent mobile apps, detect user behavior
 - Phone sensor data + Machine learning
 - Application areas:
 - Health, wellness, drunk detection, wound analysis
 - Security
- **Important:** Prefer students who know Machine/deep learning, mobile/Android programming



MQP Idea: COVID Passive Monitoring App

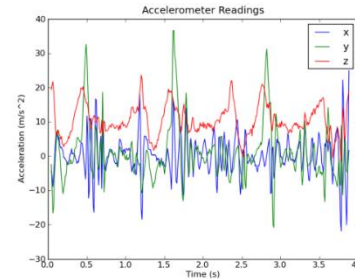


- **Problem:** Interventions (contact tracing, social distancing) paper-based
- **MQP idea: Passively do**
 - **Contract tracing:** Estimate number of “contacts” (close proximity) each smartphone user has, and who they are (uses bluetooth, WiFi co-location)
 - **Isolation monitoring:** Passively monitor how well each smartphone user isolates themselves (e.g. using distance traveled, busy places visited, etc)
 - **Case studies:**
 - Quantify/categorize smartphone users’ risk level (low, medium, high)
 - Pretend a smartphone user gets infected, SMS to all their contacts

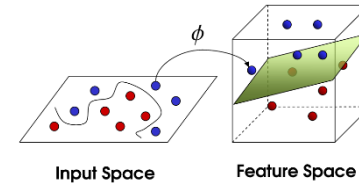
MQP Idea: Recognize/Distinguish Smartphone Users based on their Walk/Gait



Walk/Gait Patterns



Raw accelerometer readings



Machine/Deep learning



Hello Bob

- **MQP idea: Distinguish smartphone users, authenticate them from their gait (walk pattern)**

- Run study or run study to gather data (accelerometer, gyroscope)
- Use machine/deep learning/Neural Networks on accelerometer, gyroscope data
- Create app using deep learning model, welcomes owner “Hello Bob” based on their walk
- Deploy, evaluate at WPI Live!!