

CAREER: Data Representation and Modeling for Unleashing the Potential of Multi-Modal Wearable Sensing Systems (CNS 1552828 | 04/2016 – 03/2022)

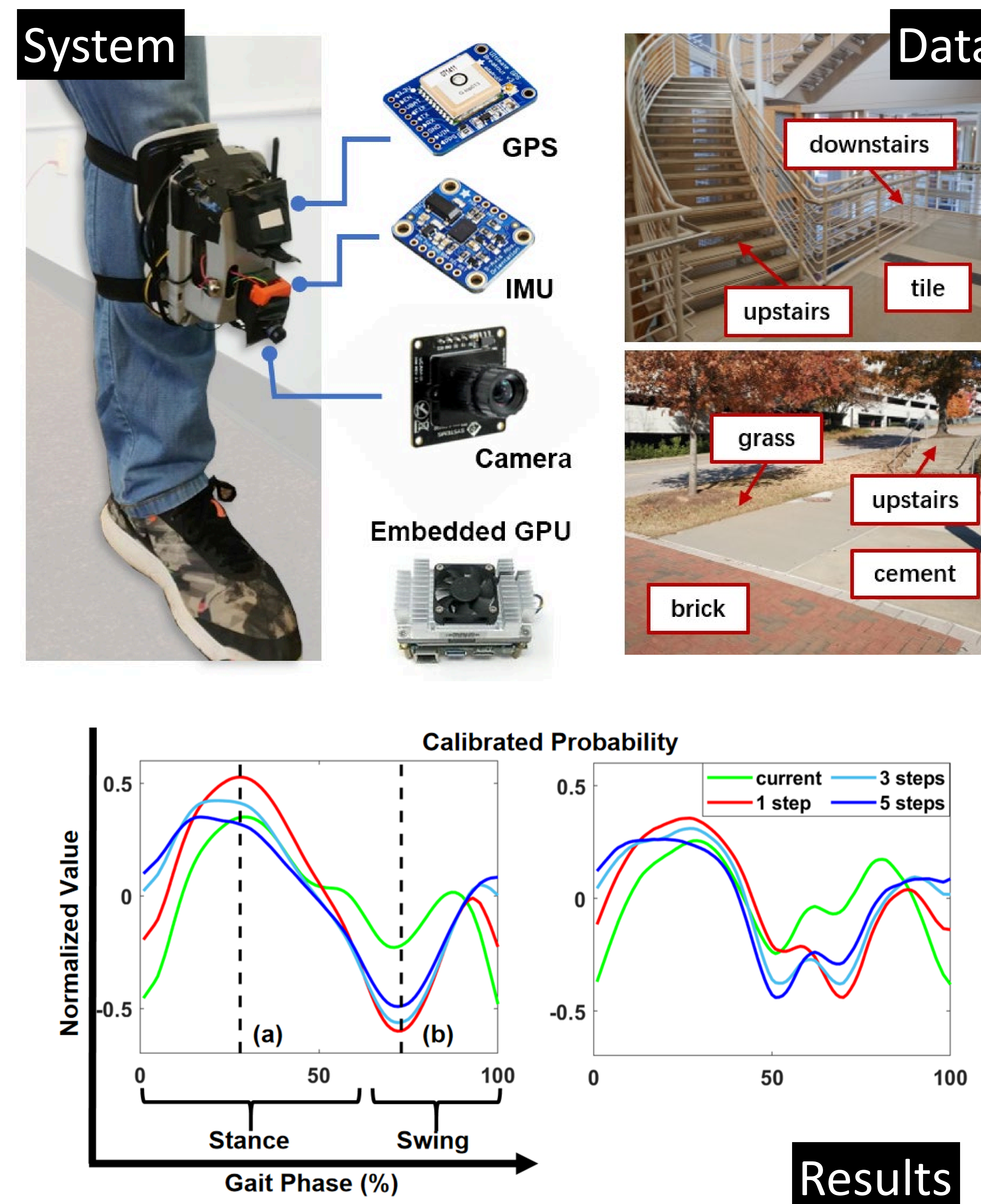
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Challenge:

- Sensor fusion (including visual sensing) for lower limb wearable prosthetic
- Uncertainty quantification to safe estimation and operation
- Real-time and reliable execution

Solution:

- Bayesian Neural Networks for uncertainty quantification which gives a well calibrated probability of correctness for safety guarantees
- Uncertainty tell us when to sample in the phase and what cycles to skip



Scientific Impact:

- The methodology provide a good calibrated probably of correctness.
- We can use the uncertainty to drive sampling strategies in order to ensure real-time and reliable performance.

Broader Impact:

- This approach can help main the use of exoskeletons and lower prosthetics safe.
- This framework can be used for other medical CPS (e.g., cardiac and respiratory).