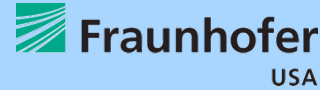
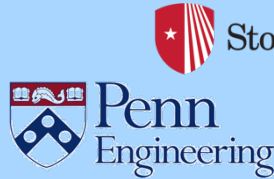


# CyberCardia: Compositional, Approximate, and Quantitative Reasoning for Medical CPS

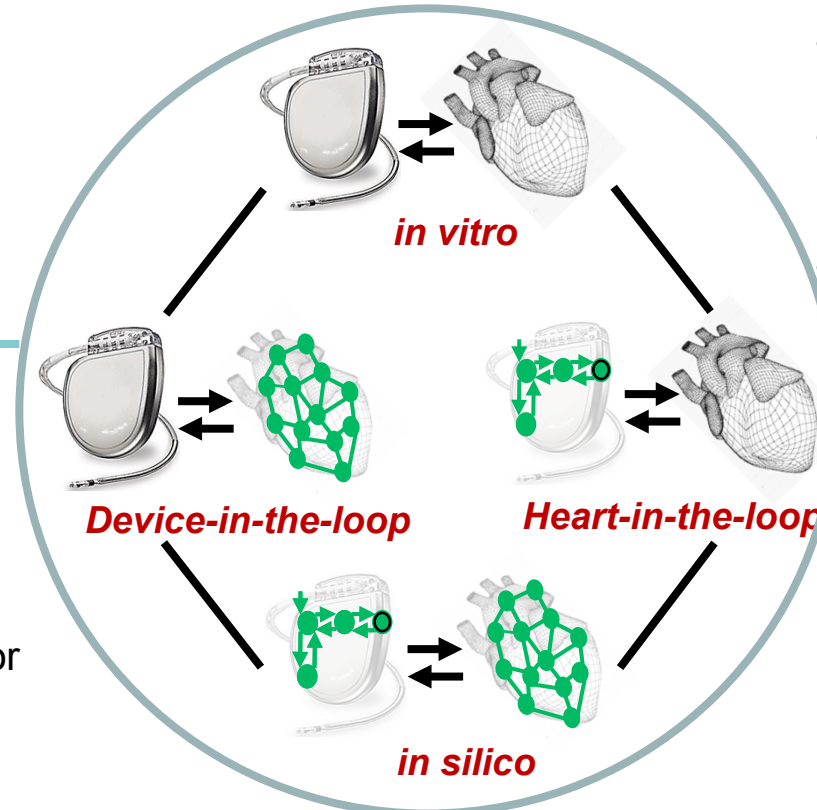


## Challenge:

- Closed-loop verification of ICDs
- Patient-specific device programming
- Accurate heart & device modeling

## Scientific Impact:

- Model-based clinical trials
- Quantitative verification of medical devices
- Patient-specific therapy guidance and device configuration
- Patient heart model in electronic health record



## Solution:

- Compositional, quantitative and approximate reasoning
- Lagrangian reachability analysis
- Finite-element method for accurate heart modeling

## Broader Impact:

- More reliable cardiac device V&V
- Interdisciplinary undergrad workshops
- Outreach to middle, high school students
- Cross-disciplinary course development