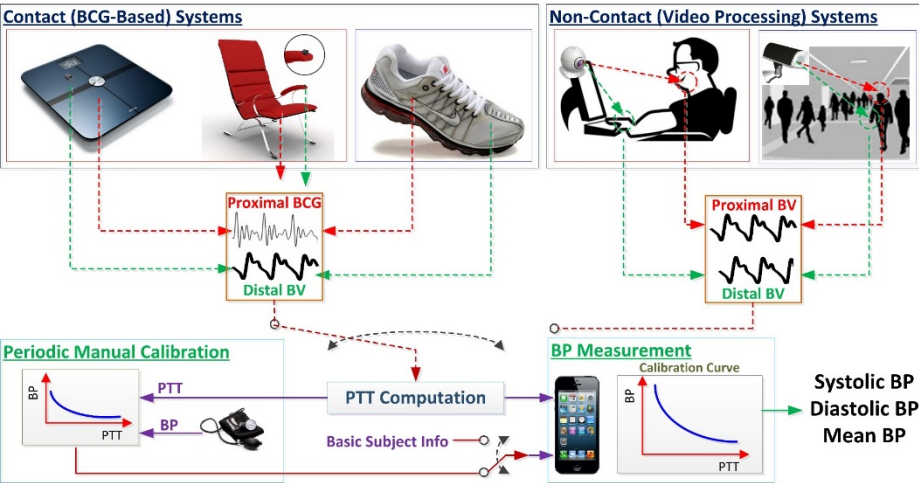


# Physiological Closed-Loop Control Systems: Modeling, Analysis, Design & Evaluation

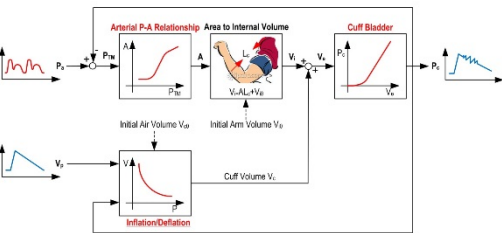
**Objectives:** Establish mechanistic understanding of physiological processes / closed-loop controls via mathematical modeling / Develop model-based approaches to monitoring, diagnostics, and treatment of diseases and pathophysiological states

## Thrust 1: Unobtrusive Blood Pressure Monitoring

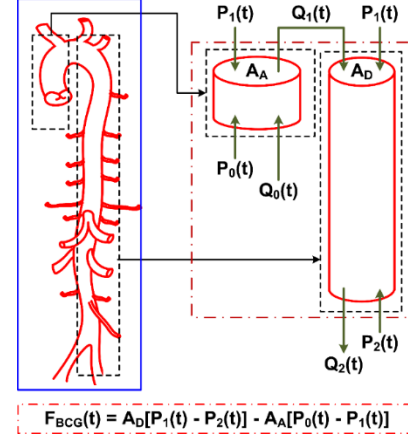
### (1) Cuff-less blood pressure monitoring



### (2) Cuff-based blood pressure monitoring

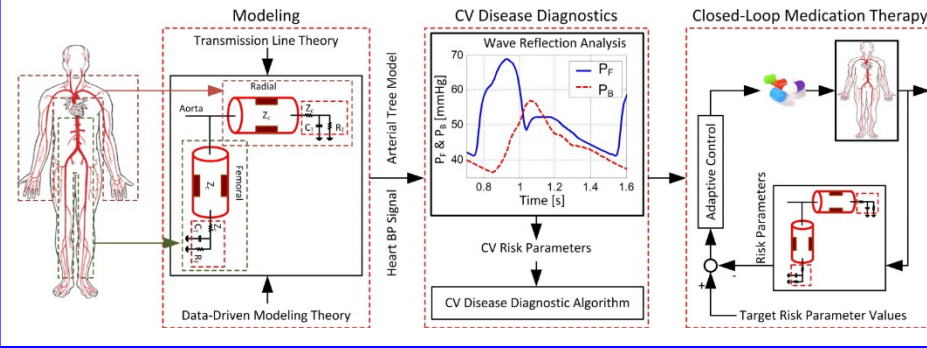


### (3) Ballistocardiography (BCG)



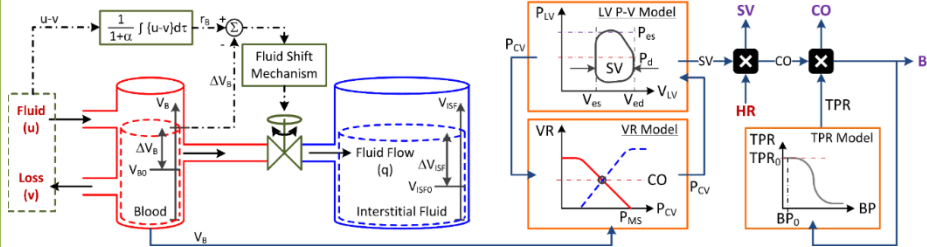
## Thrust 2: Cardiovascular Health/Disease Monitoring

- (1) Subject-specific, data-driven lumped-parameter modeling
- (2) Cardiovascular risk predictor estimation & monitoring
- (3) Cardiovascular disease diagnosis (artery stiffening/PAD/aortic aneurysm)



## Thrust 3: Autonomous Critical Care Technologies

- (1) Development of mathematical models as in-silico testing tools



- (2) Closed-loop control design & analysis for medication infusion

