# CPS: TTP Option: Identifying, characterizing, and shaping multi-scale cyber-human interactions in mixed autonomous/conventional vehicle traffic

## Award #1739869/Sep, 2019/Soyoung Ahn (CEE), John Lee (ISE), Dan Negrut (ME)，(University of Wisconsin Madison)

## Challenge

- When do the drivers of Level 2-4 automated vehicles tend to take over control of the vehicle?
- How do such interventions affect mixed traffic flow?
- How can driver interface and vehicle control be designed to mitigate undesirable interventions?

## Solution:

- Perception threshold models and evidence accumulation models to study driver intervention
- An analytical, probabilistic model with a Bayesian approach to describe the cascading impact on traffic flow
- SynChrono and Chrono infrastructure for physics-based simulation of multi-agent autonomous vehicles
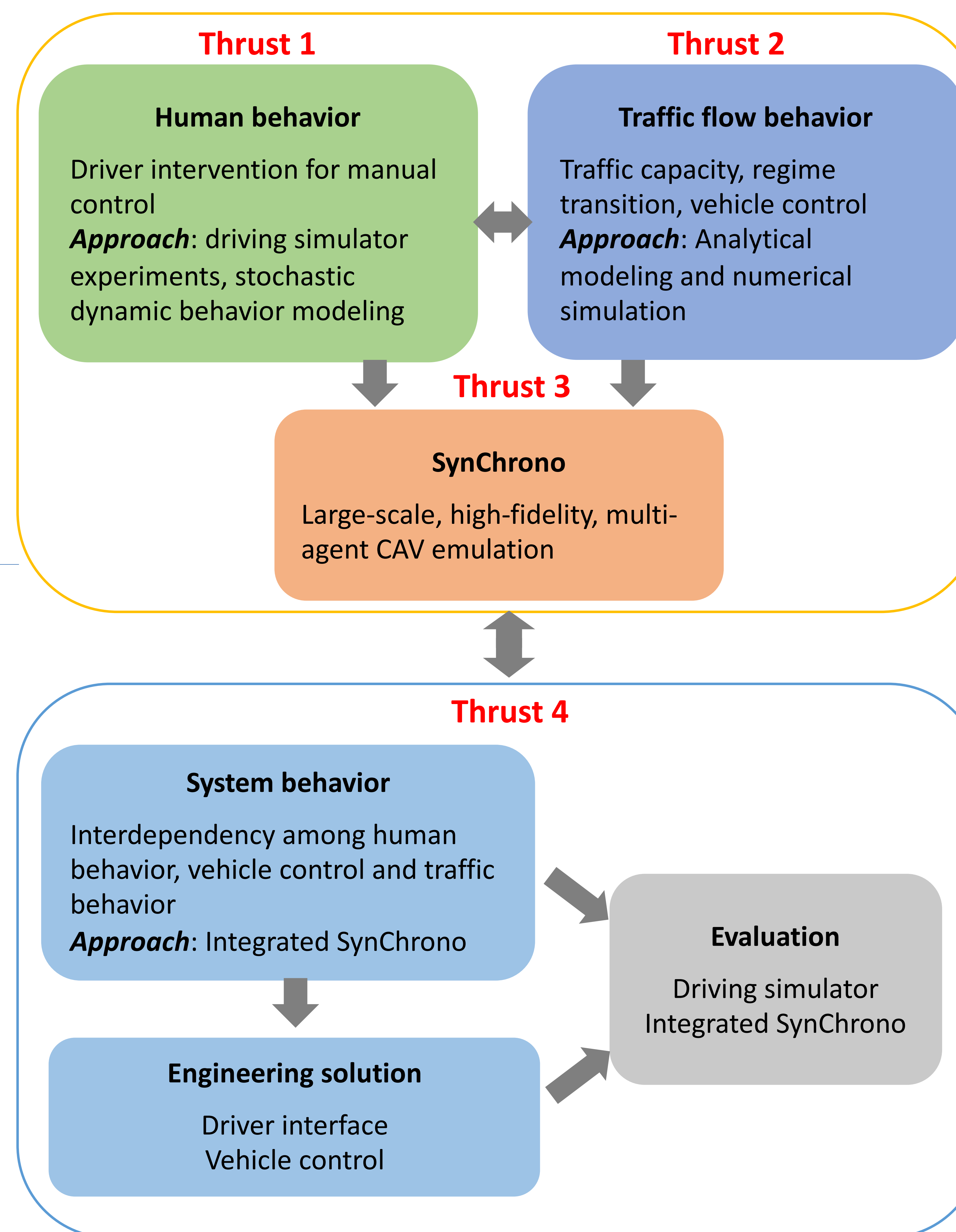


## Scientific Impact

- A better understanding of human interaction with increasingly autonomous vehicle systems
- Traffic flow modelling in a partial vehicle automation environment
- Large-scale physics-based, high-fidelity multi-agent simulator

## Broader Impact

- Promoting the Computational Science Initiative
- Education and outreach using our driving simulator
- Engineering Expo participation
- Development of educational modules
- Technology transfer to current industry partners (Volvo and Toyota)

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