CRII: CPS: Bilateral Adaptation between Models for Human-Perceived Safety/Comfort and Autonomous Driving Controllers

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Challenge:

- Technical safety/comfort of AVs is not equivalent to human perceived safety/comfort
- Need to understand and improve human perceived safety/comfort while retaining the safety and efficiency

Solution:

- Human studies in a high-fidelity autonomous driving simulator
- A new inverse model predictive control (IMPC) approach to model human and AV controllers
- A bilateral adaptation approach to improve human perception while retaining safety and efficiency

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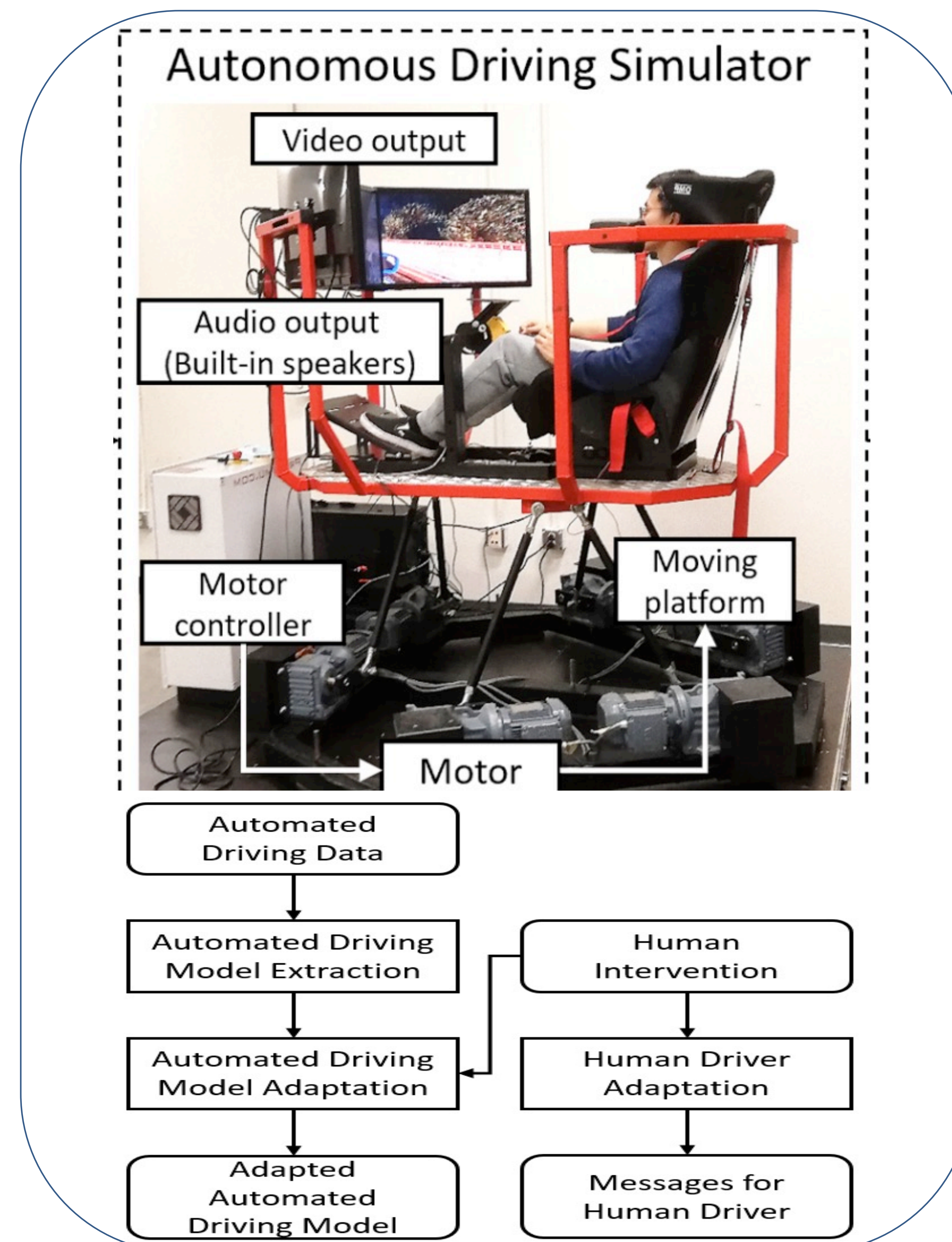
Scientific Impact:

- Understand and model human driving control and autonomous driving control
- Bilateral adaptation of the two controllers to migrate them to consistency

Broader Impact:

- Improve perception and user acceptance of AVs
- Outcomes are disseminated, e.g., shared by Schaeffler for vehicle comfort R&D work
- 2 PhD, 5 master, and 1 undergraduate. One college outstanding graduate researcher award.
- 2 courses related to AVs
- Annual K-12 summer camp since 2018