Joining Models of Human Behavior and Technical Systems

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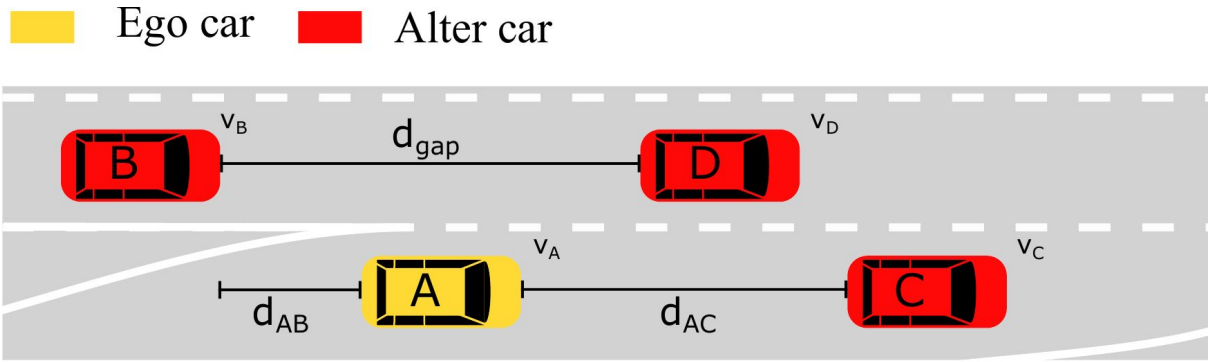
Motivating Example

Lane-merging of an highly-autonomous vehicle. Human is still in the loop.

Collision Avoidance System (CAS) and Blind Spot Warning (BSW)

Scenario 1: rear-end car C

Scenario 2: collide with car B

Ex-post analysis of unwanted events.

Apply causal reasoning

Develop causal models.
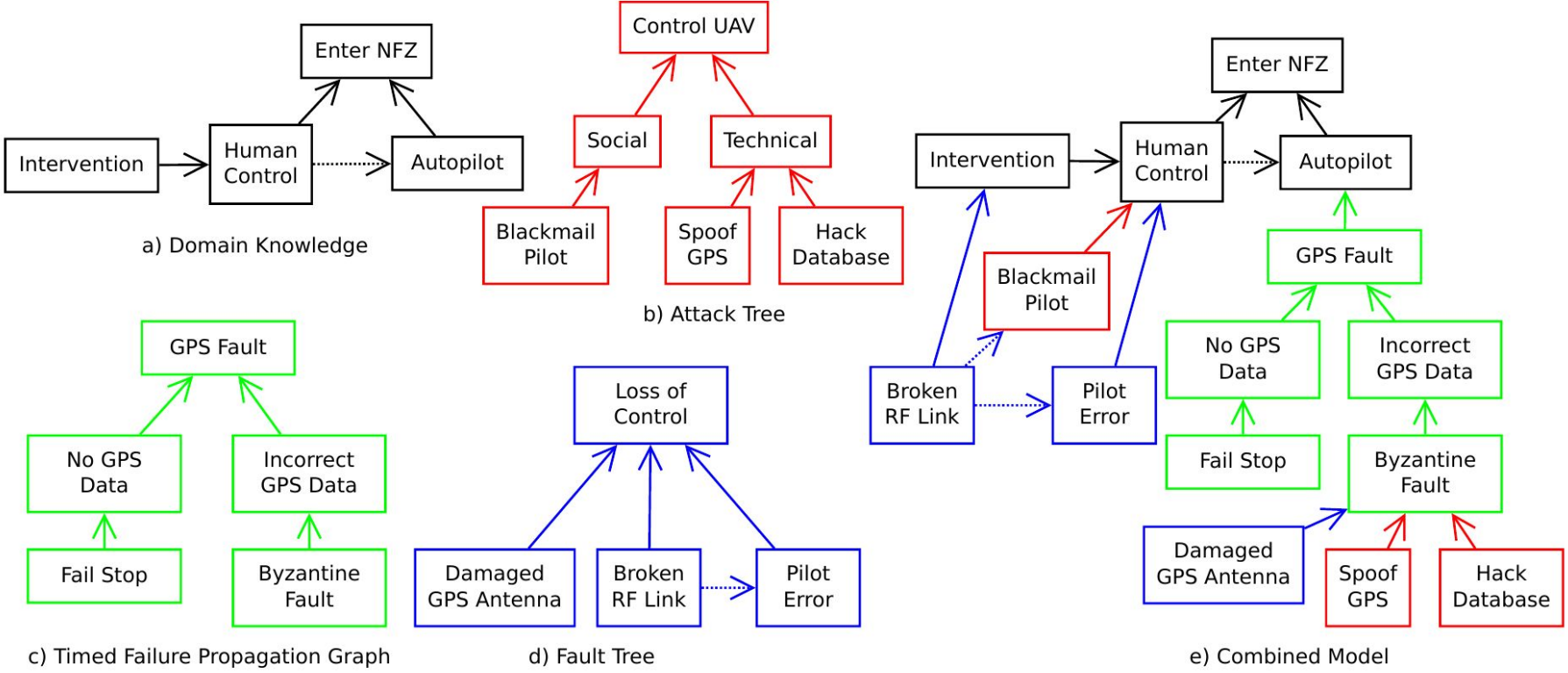
Collect evidence to set the context.

Reason over these models.
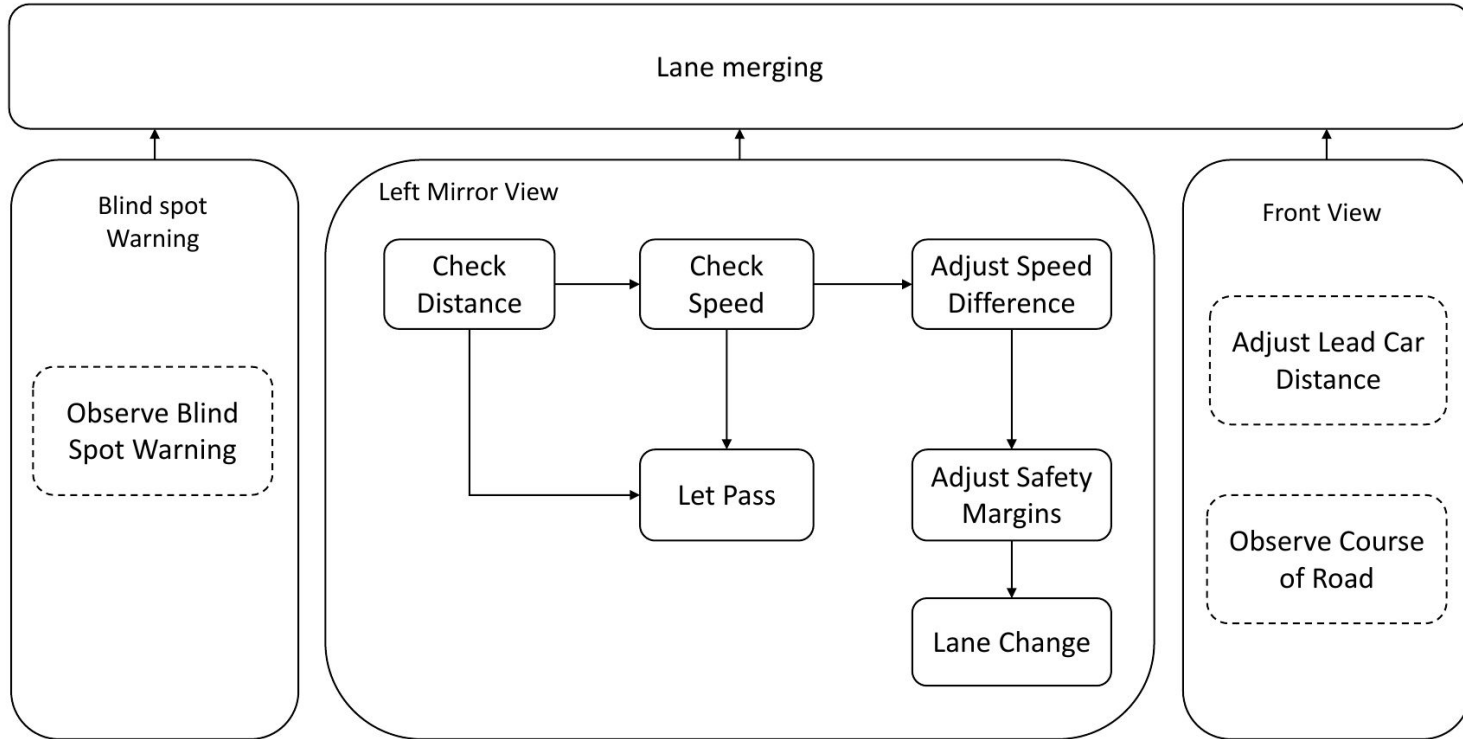
Discuss and revise the models.

Use these model to attribute blame and accountability.

Spoiler Alert: We are not there yet. Far from it.

Example

a) Domain Knowledge

b) Attack Tree

c) Timed Failure Propagation Graph

d) Fault Tree

e) Combined Model

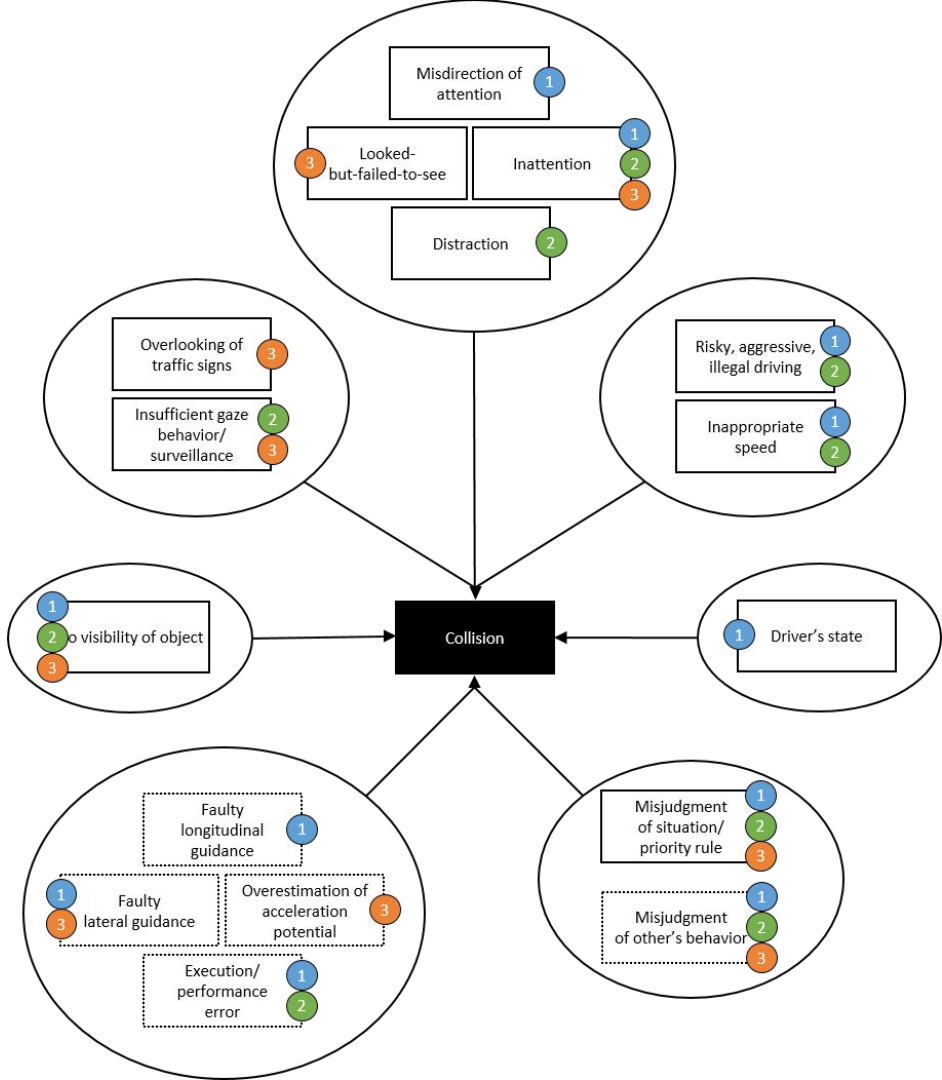# Human Models

However: how do we validate those models?

PIRE II: We work with Subproject 1, who have experience in modeling exactly that!

Focus on assistance systems for visually impaired drivers.

Example

Joining multiple models of human behavior into a single causal model that can later be validated.

Conclusion

Together with our partners in Vanderbilt, we work on ways to

- Combine models of human behavior with models of technical systems
- To validate the human models, by combining the knowledge of different models into a single model that can be validated.
- Use empirical experiments to validate the model.