Interactive Planning

- Human behavior inherently deviates from expected or pre-planned trajectories.
- Feedback planning strategies pre-plan proper reactions

Human Behavior Prediction

- HMM-based incremental learning framework
- Primitive-based approach
- Online and unsupervised segmentation, clustering and prediction
- Extended HMMs adding time information achieving a smooth output generation
- Task execution prediction
- Smooth and continuous prediction over time
- Continuous smooth inter-primitive prediction

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Dynamic Role Allocation

- Humans dynamically change roles in joint-action tasks
- How to shape a robot’s control input dependent on human input?
- Effort sharing strategy by decomposing input to the object
- Large-scale HR-study on the effects of dynamic role allocation by adapting $\lambda_j$

Confidence-based Assistance

- Prediction-based anticipatory behavior generation
- Intuitive assistance using risk-sensitive optimal feedback control
- Understanding the human as source of variability
- Adaptive gains considering prediction uncertainties and process noise

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Selected publications: