Angewandte Informatik – Applied Informatics

Prof. Britta Wrede
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Vorsitz: Master Intelligent Systems

Teaching

Musterklassifikation – Pattern Recognition
Bildverarbeitung – Image Processing
Spracherkennung – Speech Recognition
Social Robotics
Applied Informatics - Research

- Attention modeling
- Speaker situation modeling
- Empathy modeling

- Social signal processing
- Stress detection and modeling

HUMAN-SYSTEM INTERACTION

- Interaction Modelling
- User Studies and Evaluation
- Perception and Interpretation
- System Engineering

- Motivational sport coach
- Inverse modeling of speech synthesis
Master Thesis: Comparison of interactive optimization algorithms in conjunction with DMP based robot skill learning

Scenario
Naive users teach Pepper to catch a ball in a cup

Problem Statement
How can non-expert users provide Pepper with adequate feedback about its skill success?

Idea
Compare a qualitative-relational teaching approach to a quantitative feedback teaching approach.

Research Question
Does a quantitative approach facilitate faster robot learning and easier human teaching?
Requirements and Goals of this thesis:
Get familiar with optimization algorithms (CMA-ES and Bayesian optimization)
Implement a setup that interactively optimizes the robot’s skill learning with user feedback using Bayesian optimization
Extend the existing framework

Existing materials
Libraries for the DMPs, CMA-ES and Bayesian Optimization
Setup where Pepper learns to catch a ball using CMA-ES w/o user feedback
https://www.youtube.com/watch?v=jkaRO8J_1XI
BA Thesis: Evaluating contingency-learning-based interactive behavior of virtual robot Flobi

Scenario
Robot tries to make user move cups based on a model predicting user behavior based on own gazing behavior, learned during interaction

Goal
Evaluation of user strategies interacting with system

Research Questions
Do users understand the robot’s underlying behavior model?
Do they show consistent tutoring behavior?
BA Thesis: Evaluating contingency-learning-based interactive behavior of virtual robot Flobi

Existing Materials
First implementation of interaction system with Flobi simulation and simple contingency-based learning strategy

Potential further goal
Add additional learning scheme (currently bi-gram), e.g. longer history, generalization over actions etc.

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Gorge Copete (Osaka University)
Thank You!