

Trusted Human-Autonomy Teaming in Teleoperations

Hussein Abbass, Dr. Sreenatha Anavatti; Dr. Michael Barlow; A/Prof. Matthew Garratt; Dr. Kathryn Merrick; Dr. Jiangjun Tang; Dr. Essam Debie

OVERALL AIM

1. Develop AI tools to automatically recognize human cognitive activities;
2. Identify cognitive and behavioural indicators for humans, and task-complexity indicators for the task, to enable efficient real-time assessment of human performance on task;
3. Design a methodology for real-time load balancing between humans and autonomous entities to ensure that the load on humans is manageable and mission effectiveness is not compromised; and
4. Design a methodology to assess and assure the trustworthiness of a human-machine team to improve mission effectiveness and operational efficiency.

Acknowledgement

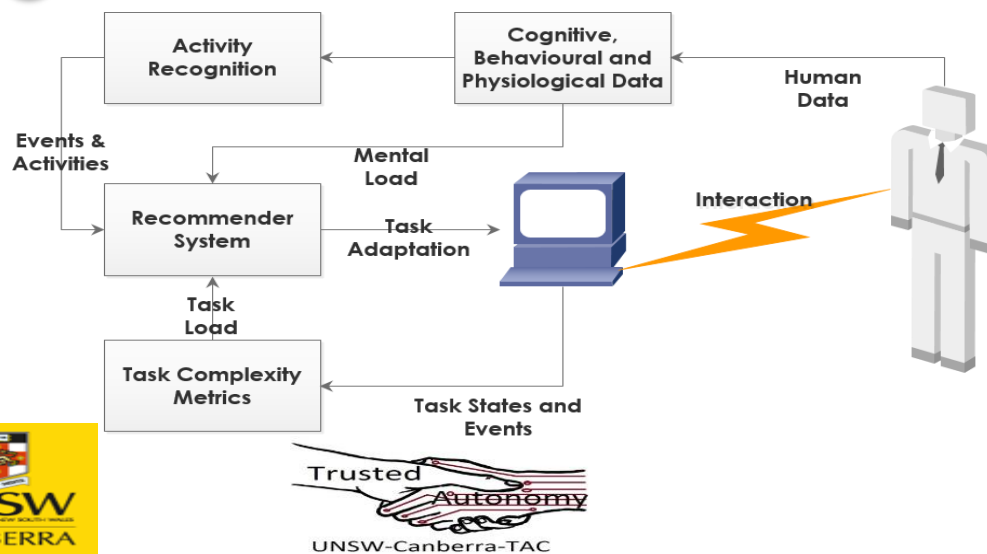
Dr. Justin Fidock, DST Group

Project Design

1 Hypotheses

1. Real-time human and autonomy indicators → are appropriate to adapt distribution of tasks
2. Adapting the distribution of tasks → will balance load on humans and autonomy
3. Balancing load on humans and autonomy → improve effectiveness and efficiency of mission
4. Improving effectiveness and efficiency of missions → improve commander's trust in autonomy

2 Framework



3 Deliverables

1. Research Plan + Preliminary Report on Activity Recognition + Preliminary Report on Cognitive and Behavioral Metrics
2. Activity Recognition Software
3. Cognitive Load Software
4. Closed Loop System
5. Trust-aware Closed Loop System
6. Fully-integrated Closed Loop System

4 Timelines

Deliverable	2017	2018	2019	2020
1	█			
2		█		
3			█	
4				█
5				
6				█

Progress

- (1) One academic paper close to submission
- (2) Data Capture System
- (3) Formation Recognition Systems

[See Video](#)

Challenges

- Delays in recruitment
- Risk has been mitigated

Opportunities

New Fully Distributed Simulation Facility
at [UNSW-Canberra](#) for
[Human Autonomy Teaming](#)
[VBS](#)
[Cognitive Performance](#)