

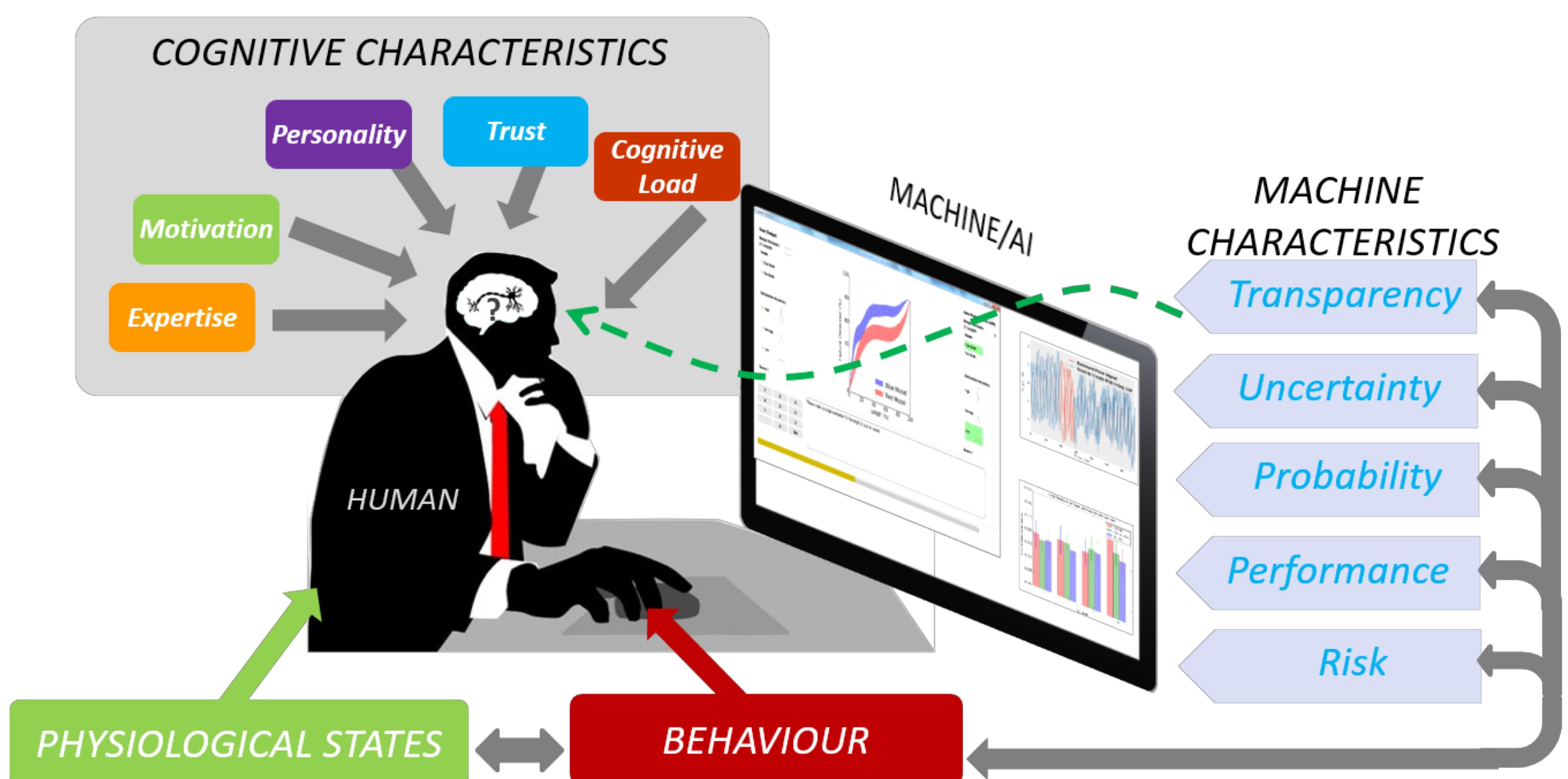
# Human and Machine Learning

## Visible, Explainable, Transparent and Trustworthy

School of Software, FEIT

[www.uts.edu.au](http://www.uts.edu.au)

We solve problems that emerge from the interplay of humans and data/machine learning. We deploy techniques from data science, human-computer interaction, and the behavioural sciences to help us understand and influence people's behaviour and their interaction with information, AI systems, and other people.



## CAPABILITIES

### Transparent machine learning

Machine Learning is still not well understood by many real-world users. We use Human-Computer Interaction approaches to make algorithmic technologies more usable by making them more 'Transparent'.

### Explainable machine learning

We possess proven experience in understanding users through interpreting their observable past behaviour and adapting future interactions to their preferences, interests and needs.

### Measurable decision making

We study human decision making – typically in decision support and recommender systems - in order to understand and improve decision quality, user trust and confidence.

### Physiological and behavioural sensing

We have more than 10 years of experience with analysing data from eye-activity, galvanic skin response, EEG, mouse movements and other signals to cast light on cognitive states such as stress, emotional arousal, etc.

### Human-machine trust

When do people trust machines? How do they respond to uncertainty? Is more information better? What does stress do to interaction? We have an extensive publication history and proven expertise in this area.

### Cognitive load measurement

Our team are world leaders in real-time, unobtrusive measurement of mental effort via behavioural analysis and physiological sensing. Applications range from call centres to mission-critical work environments such as aviation.

### Applying behavioural models to real world problems

Data is only half the story – we apply rigorously developed cognitive and social models to user behaviour and therefore offer predictive power – and being able to 'nudge' people towards desired behaviours.

## CURRENT PROJECTS

### Transparent Machine Learning

Machine learning is a "black box" for domain users. We investigate variations of human multi-modal behaviours in machine learning based solutions to understand factors that affect the use of machine learning results. We propose DecisionMind as a multi-modal interface for making machine learning "transparent" to domain users.

### Explainable Machine Learning

We investigate approaches to explain machine learning process and results with:

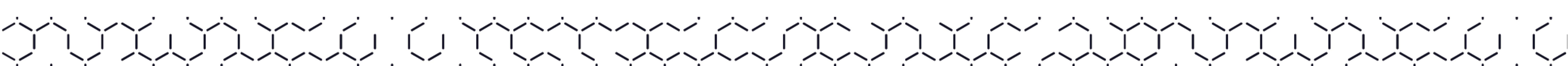
- Influence of training data points;
- Uncertainty of input data and models;
- Comparison visualization of machine learning models.

### Trustworthy Machine Learning

We explore human trust in machine learning based on algorithms, human cognitive responses, human evaluation, domain knowledge and real-world applications in predictive decision making scenarios.

### Predictive Decision Making

Data Analytics-driven predictive decision making has applications everywhere. We investigate the effects of varying model conditions such as uncertainty visualizations and human factors such as cognitive load levels on user decision confidence and human-machine trust by utilizing HCI techniques.



FOR FURTHER INFORMATION

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