



**UNSW**  
SYDNEY

## Signal, Information and Machine Intelligence Lab

**Working at the crossroads of health and technology to apply signal processing and machine learning algorithms to data, such as speech and bio-signals, to assist healthcare providers and improve the quality of patients' lives.**

### Competitive advantage

Expertise in:

- Non-intrusive health monitoring via audio signals
- Disordered speech monitoring
- Behavioural analyses
- Biomedical signal processing
- Machine learning and pattern classification
- Analyses of EEG, ECG, heart rate, respiratory rate, skin conductance
- Voice biometrics

### Impact

With the use of machine learning and artificial intelligence, data such as speech and bio-signals – which contain tremendous amounts of information about health and wellbeing – can be used to determine if patients are at risk of health problems, provide feedback on the effectiveness of therapy and to interpret and help to regulate stress levels.

### Successful outcomes

- Validated automated speech therapy system for children with apraxia of speech in clinical trials
- Prediction, detection and monitoring of a number of conditions and emotional states
- Fluorescence lifetime imaging endoscope
- Bayesian frameworks for incorporating uncertainty into machine intelligence for prediction and recognition of ambiguous, subjective and perceptual attributes such as emotional state
- Characterisation and recognition of speaker attributes in voice biometric systems
- Smartphone applications to monitor mental states and speech disorders
- Longitudinal validation of biofeedback games for stress self-regulation

### Capabilities and facilities

- High performance computing capabilities for large scale signal and information analysis, and training machine learning models
- Large library of code, scripts and databases of speech and other signals
- Soundproofed, light-controlled studio facility for recording speech and behavioural signals

### Our partners

- Charité – Universitätsmedizin, Berlin, Germany

### More Information

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- Texas A&M Diagnostic Sciences, College Station, USA