Laboratory of Signal Processing

Imaging and Computer Vision
Audio and Signal Processing
Machine Learning and Pattern Recognition (Artificial Intelligence)

http://www.tut.fi/dsp

Facts and Figures

- Research oriented laboratory with international staff and strong international reputation
- 130 researchers working in 14 research groups:
  - Speech and Audio (Prof. Tuomas Virtanen)
  - Immersive Visual Technologies (CIVIT) (Prof. Atanas Gotchev)
  - Computational Imaging (Prof. Karen Egiazarian)
  - Computer Vision (Prof. Joni-Kristian Kämäräinen)
  - Signal and Image Restoration (Prof. Alessandro Foi)
  - Multimedia (Prof. Moncef Gabbouj)
  - Data Mining (Prof. Ari Visa)
  - Statistical Signal Processing (Prof. Ioan Tabus)
  - Machine Learning (Prof. Heikki Huttunen)
  - Artificial Intelligence and Vision (Prof. Esa Rahtu)
  - Artificial Intelligence (Prof. Tapio Elomaa)
  - Speech and Cognition (Prof. Okko Räsänen)
  - Audio Analysis (Prof. Annamaria Mesaros)
  - Data Analysis Applications (Pori Unit) (Prof. Tarmo Lipping)

Tampereen yliopisto
Tampere University

Department of Computing in Tampere University hosts more than 400 researchers and over half of them in the AI related fields, e.g.,

- Natural language processing
- Genomics & medical data analysis
- Economical data analysis
- AI hardware

Research Profile

Imaging and Computer Vision (Egiazarian, Gotchev, Kämäräinen, Rahtu)

Pattern Recognition and Machine Learning (Gabbouj, Elomaa, Huttunen, Lipping)

Audio and Signal Processing (Foi, Mesaros, Räsänen, Virtanen, Visa, Tabus)

In collaboration with the Faculty of Engineering Sciences: TUT Robotics

Teaching Profile

BSc, MSc and PhD courses on the following ICT topics:

- Imaging and Computer Vision
- Pattern Recognition and Machine Learning
- Audio and Signal Processing

Annual ICT intake is 150 BSc engineering students plus 60 MSc international students

EE and CS ranked ~200th by NTU/TIMES Ranking

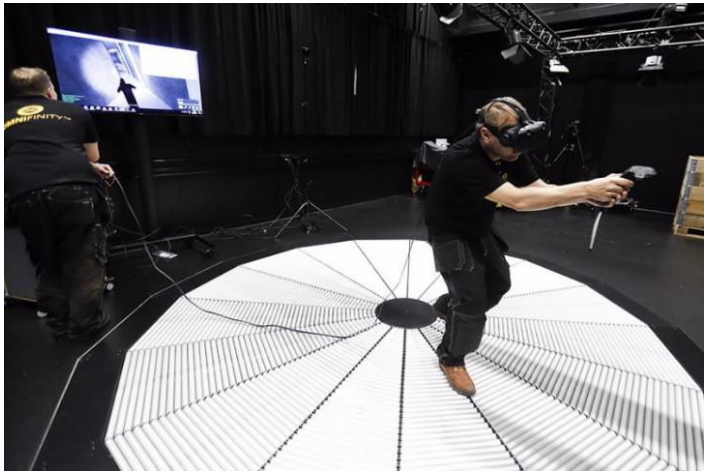
Imaging and Computer Vision

Tampere is a “Silicon Valley of Imaging Technology” attracting many small and large companies (Nokia, Intel, Huawei, Helmee Imaging, Optofidelity, Grundium, NomiCam, Noiseless Imaging, AAC, Polight, Provizanto, PowerVision, Axon, etc)

TITLE	CITED BY	YEAR
Image denoising by sparse 3-D transform-domain collaborative filtering K Dabov, A Foi, V Katkovnik, K Egiazarian IEEE Transactions on Image Processing 16 (8), 2080-2095	4000	2007

Imaging and Computer Vision

Displays and virtual/augmented reality techniques are under active research



Imaging and Computer Vision

Deep learning based technologies have changed the landscape of vision and imaging

Pattern Recognition and Machine Learning (AI)

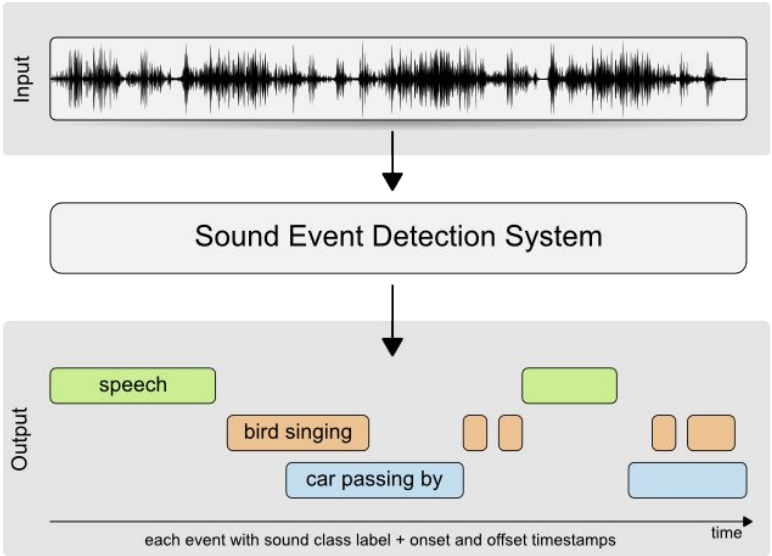
Our main focus is on developing PR and ML for vision, audio and signal processing

Machine learning in robotics is gaining momentum

Audio and Signal Processing

We conduct high quality research on audio event detection and audio enhancement and source separation

Long term research on defence related applications (radar signals etc.)



TUT Robotics

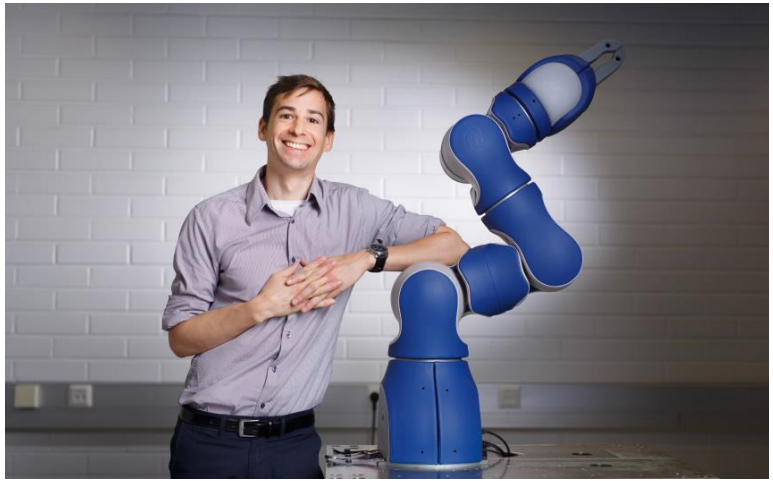
Joint effort of the two TUT Faculties:

- Engineering Sciences - Core Robot Technology and Mechatronics
- Computational and Electrical Engineering - AI Robotics, Perception, Communication

Robotics major available for MSc students in the both faculties

Collaborative Robotics

Seamless collaboration between humans and robots



Heavy Outdoor Robotics

We develop next generation - more autonomous and more easily programmable (e.g., teaching by demonstration) - heavy machinery

Industrial Manufacturing

Humans and robots perform collaboratively tasks in shared workspaces

AI Robotics

Machine learning is disrupting robot technology

Laboratory of Signal Processing

40 Years of Signal Processing

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