NANYANG TECHNOLOGICAL UNIVERSITY

A Smart Nation Translational Lab.

Centre for Infocomm Technology

Overview

The centre has already embarked in several projects with various government agencies to develop new technology that will benefit the general public in urban living.

Design

Mapping requirement to our R&D strength and capability.

Establish feasible timeline for trial/prototype deployment.

Co-work with key partners for large scale feasibility evaluation and commercial implementation.

Digitization

Anything “Smart” requires data collection. The School of EEE accumulated decades of signal processing capability on audio, acoustic, image and video, which serve as a foundation to make anything “Smart”.

Intelligence

Modularized machine-learning algorithm is available depending on the end application requirements.

High-end audio/video/acoustic capture equipment and rapid prototyping platform has been set up in the laboratories to quickly demonstrate technology feasibility.

NTU campus provides an ideal real-life test bed for trial and experiment to perfect the technology prior to actual commercial deployment.

Translational R&D Partners

We believe in co-innovation, and these are our key partners to deliver innovative services for now and in the future.

Government Agencies

- Infocomm Development Authority of Singapore (iDA)
- Land Transport Authority (LTA)
- National Environment Agency (NEA)
- National Healthcare Group (NHG)
- Housing & Development Board(HDB)
- Municipal Service Office (MSO)
- Ministry of Home Affairs (MHA)

Industry Partners

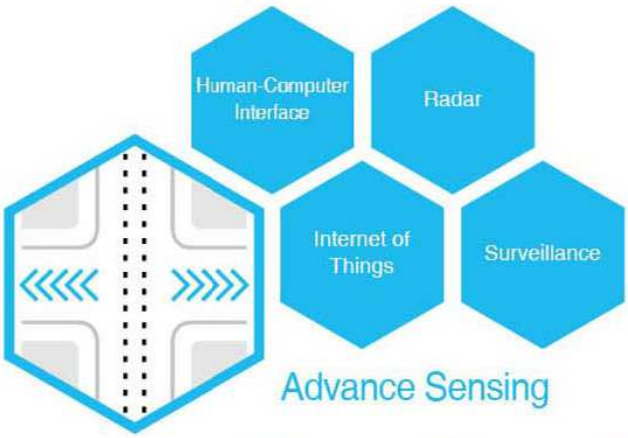
- Evercomm Uni-Tech Singapore
- IHI Asia Pacific Pte Ltd
- National Instruments Singapore Pte Ltd
- NXP Semiconductors Singapore Pte Ltd
- Schaeffler (Singapore) Pte Ltd
- Singapore Infocomm Technology Federation (SiTF)
- ST Electronics
- ST Engineering
- Car Club Pte Ltd
- Chemtronics
- DENSO International Asia Pte. Ltd.
- Hong Kong Applied Science and Technology Research Institute Company Limited (ASTRI)
- IHI ASIA PACIFIC PTE LTD
- Panasonic R&D Center Singapore (PRDCSG)
- Red Hat Asia Pacific Pte Ltd
- Zebra Technologies Asia Pacific Pte Ltd

Translational from within

The centre's IoT data supply chain is powered by Evercomm - a startup co-founded by our own EEE alumni and researcher! Together, our work in translational R&D has been acknowledged by National Research Foundation, Infocomm Development Authority of Singapore (iDA), SPRING Singapore and Evercomm has received various awards/recognition from prestigious organization such as Forbes Asia, Frost & Sullivan, World Entrepreneurship Forum and more.

Research-as-a-Service

The most effective way to acquire cutting-edge capabilities.

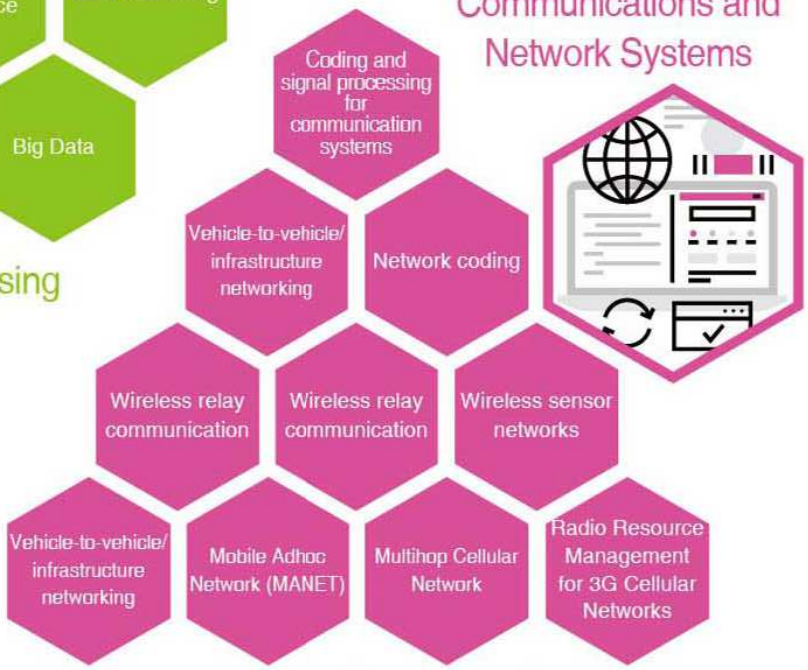


Advance Sensing

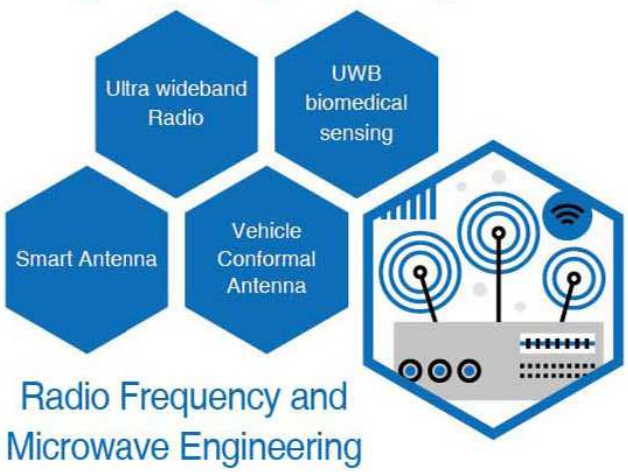
Cyber and Network Security

Advance Sensing

Communications and Network Systems



Navigation and Positioning



Radio Frequency and Microwave Engineering

Our Story

Young and research-intensive, Nanyang Technological University (NTU Singapore) is ranked 13th globally, and 1st amongst the world's best young universities. As we are part of the driven force behind this achievement, our vision is to become a leading centre of excellence for translational R&D in areas such as information and communication engineering.

In line with the Singapore Research, Innovation and Enterprise (RIE) 2020 roadmap, the centre now gears itself towards supporting Singapore Smart Nation vision by providing cutting-edge technology capability through our Research-as-a-Service programme.

ICM RESEARCH IN THE SCHOOL OF EEE

92 Faculty

287 Research staff

482 PhD students

>2,500 Undergraduate (EEE/IEM)

6 Corp / Joint Labs

65 Industrial partners

5 Research Centres

40/17 Patents filed / License signed (last 5 years)

2,800 Research Publications (last 5 years)

$96M Grants from Industry and Public Sectors

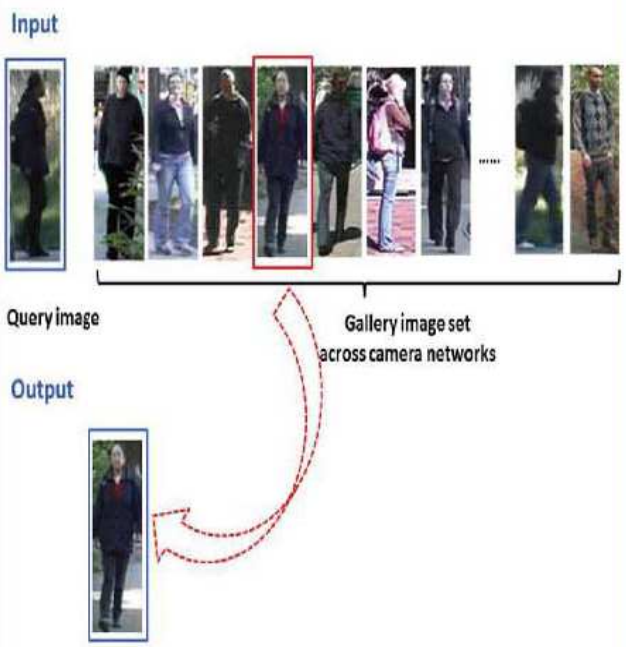
$132M Grants from Funding Agencies

12 NRF PoC

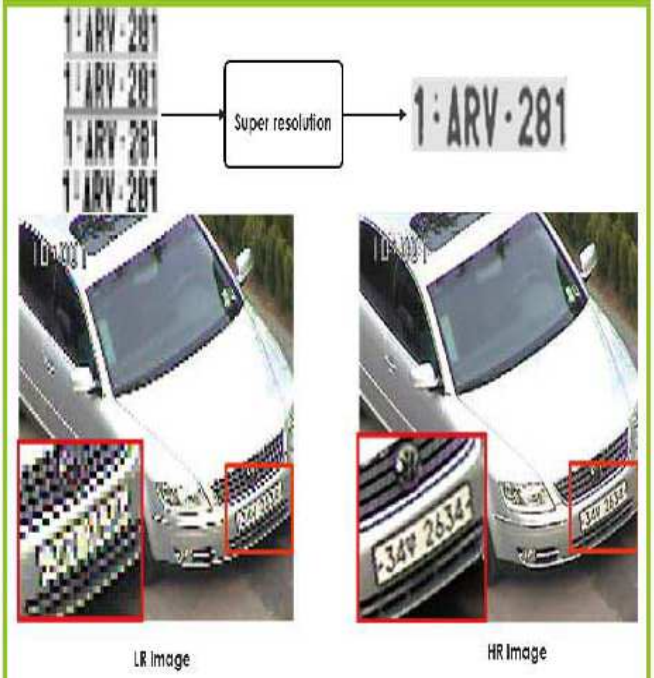
10 Spinoff Companies

Technology Portfolio: Video Analytics

Embedded Video Analytics

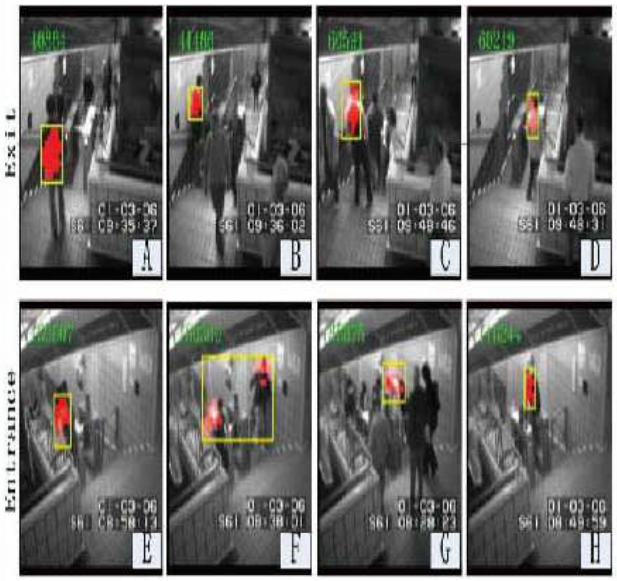


Super-Resolution



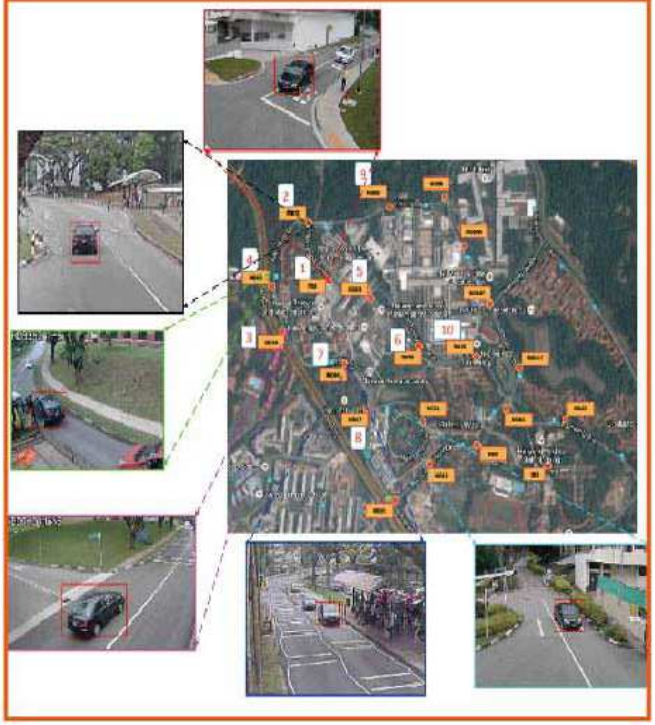
Action Recognition

Abnormal Behavior Detection



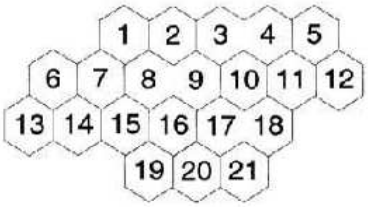
Technology Portfolio: Communication

Vehicle Tracking in Camera Network

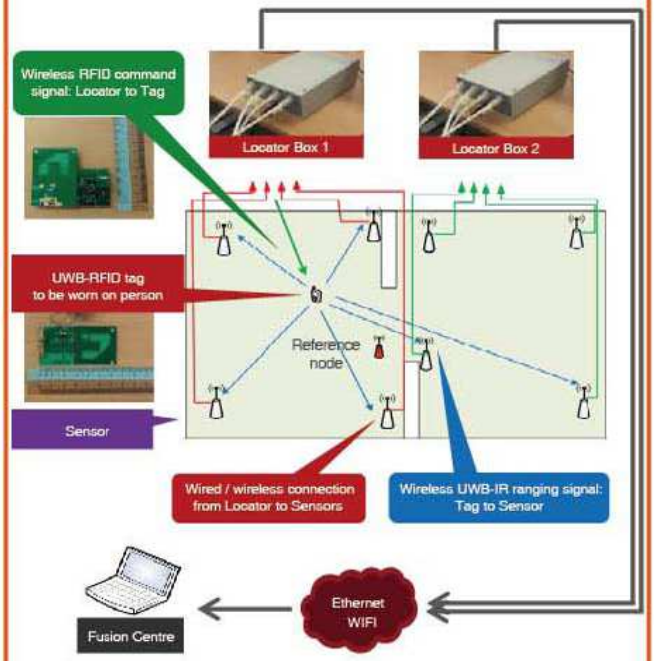


Channel Assignment / Broadcast Scheduling

- Channel Assignment
  - Minimize interference with optimal channel assignments
  - NP-hard combinatorial optimization problem
  - Collaboration with Singapore Telecomm
- Broadcast Scheduling
  - Minimize the TDMA frame cycle
  - Minimize the total transmissions (channel utilization)



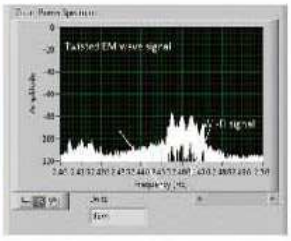
Ultra Low Power Indoor Localization



Secure Communication

- Secure Communication
  - Stealth and reslilent property against jamming or intercepting signals.
- S"RF coding":
  - Combine with conventional coding methods to provide an addtional layer of security

Twisted EM wave transmitter and receiver placed in school of EEE, NTU



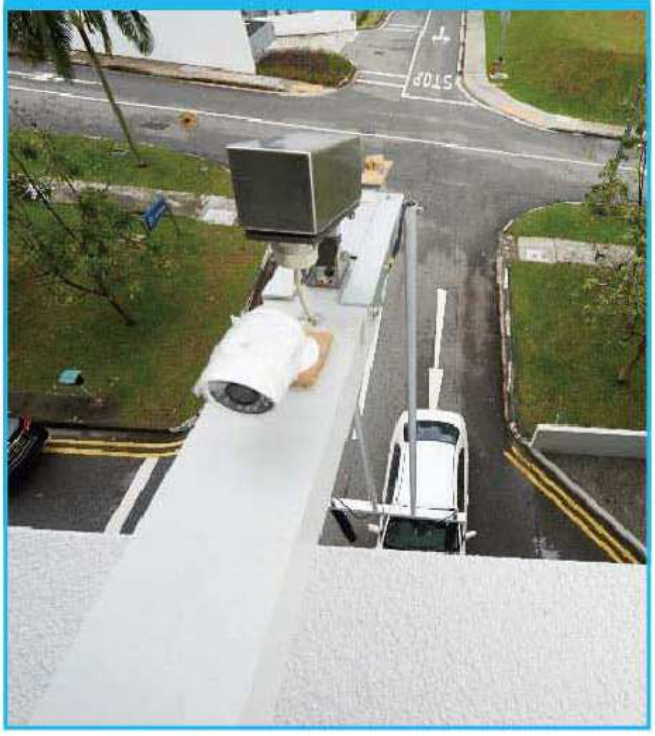
Coexistence of Twisted EM wave and Wi-Fi signals

Technology Portfolio: Acoustics

Active Noise Shield

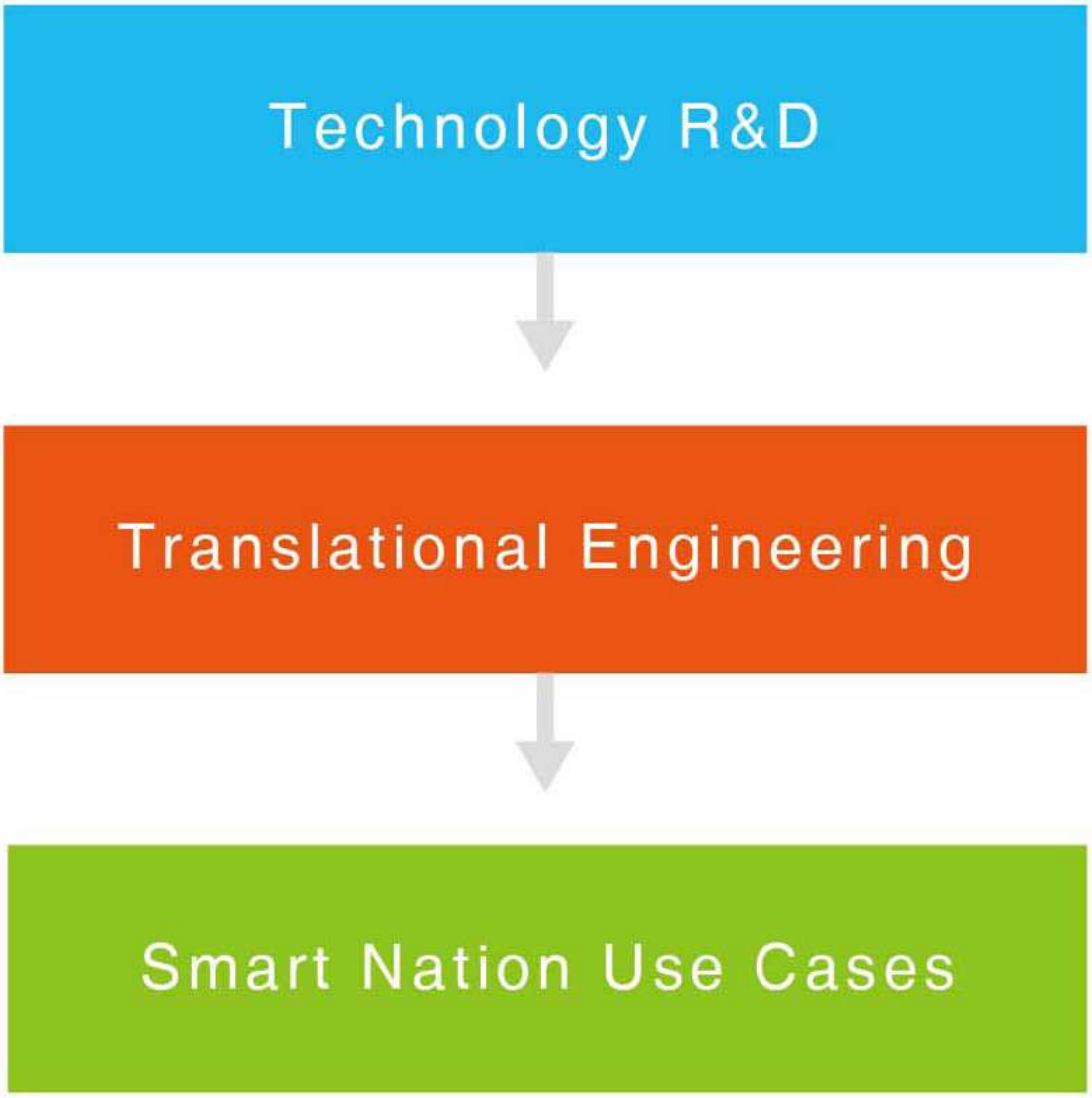
Sound Classification for Robot

Vehicle Noise Sensing

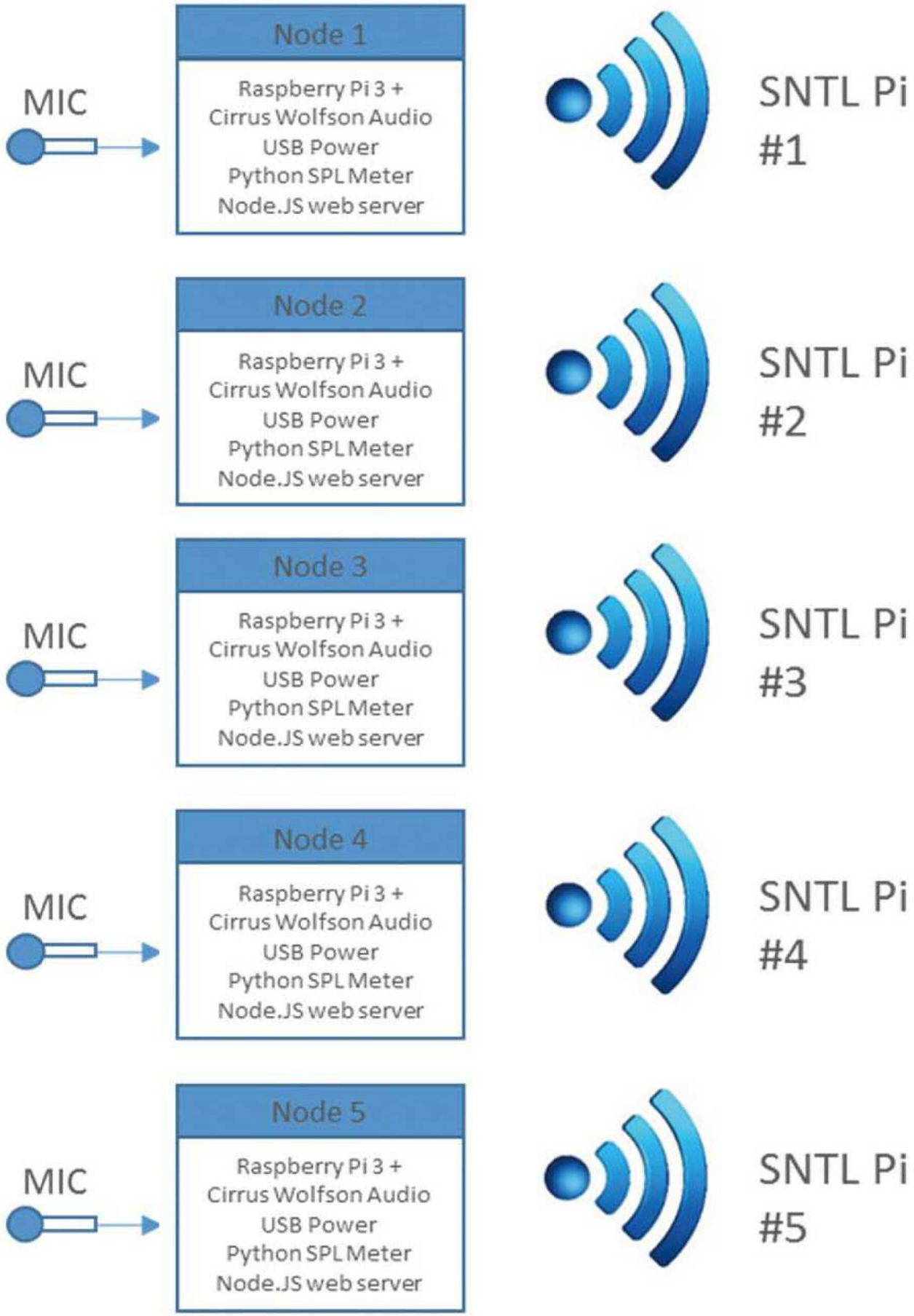


Soundscaping

Applying Technology to Use Cases



Acoustic Node Processing

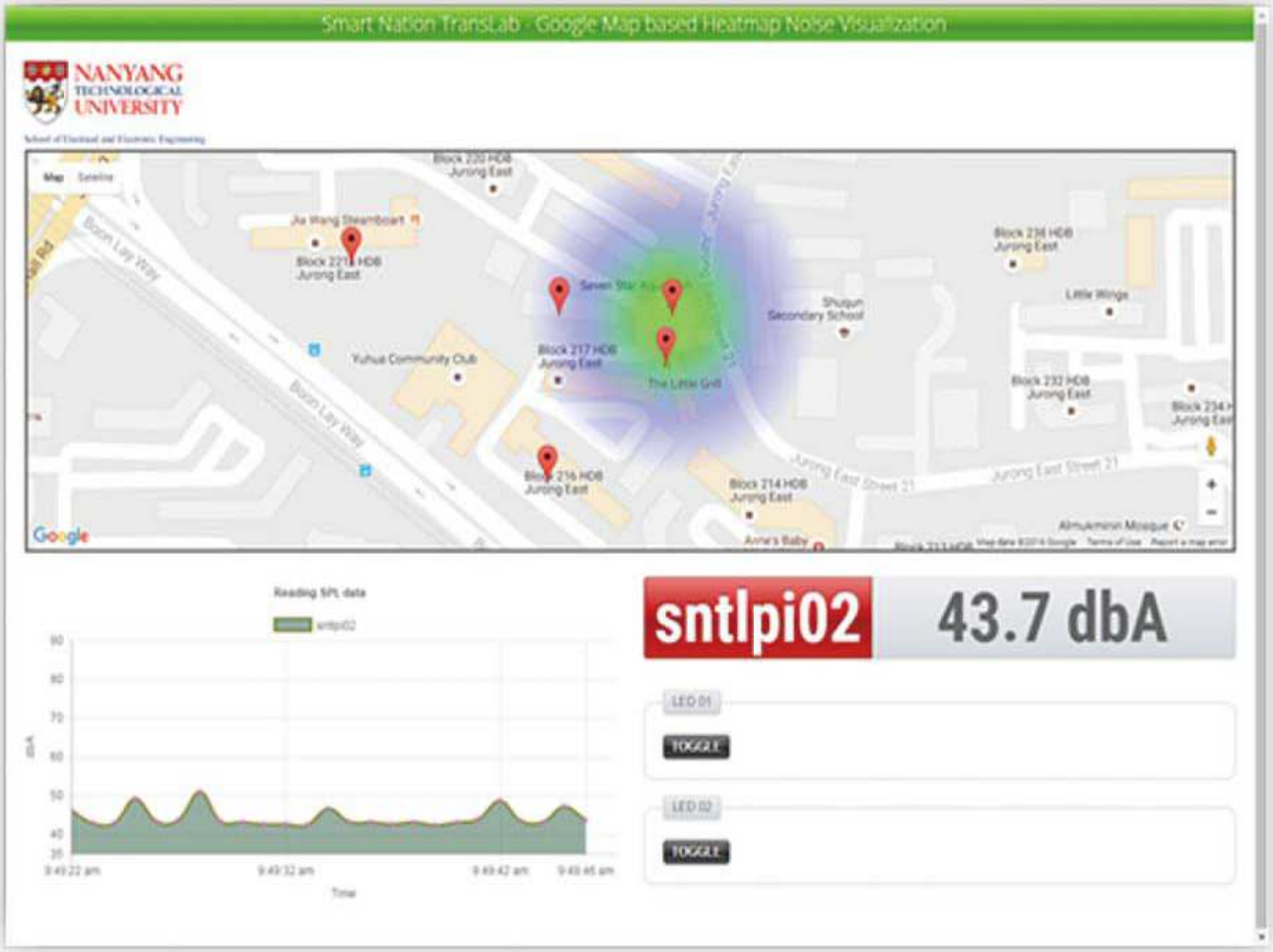


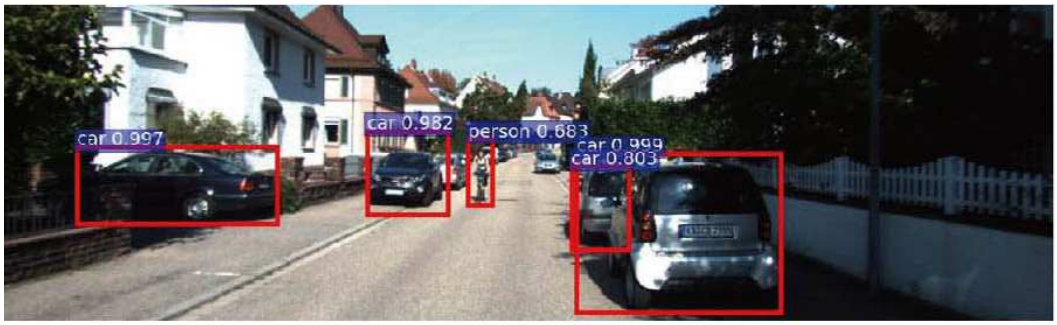
Remote Acoustic Monitoring

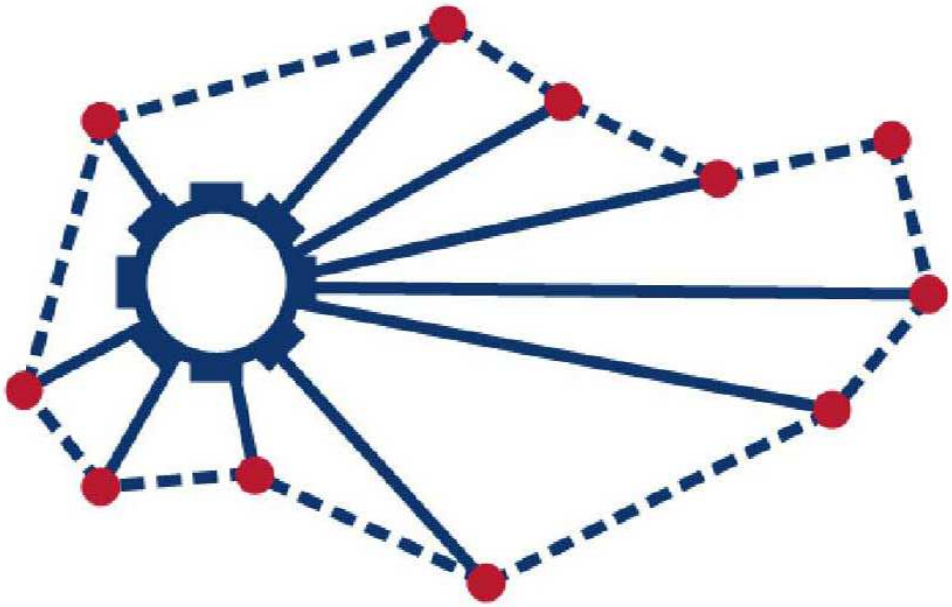
Gateway

Any WiFi B/G/N router

- Sound level visualization:
  - Data is pushed through web socket by the node
  - No complex processing is executed on the node
  - Client is responsible for running the visualization
  - Visualization technology used:
    - HTML5, Jquery, Node.JS, Chart.JS
    - Google Map







NTU EEE Centre for Infocomm Technology –

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Contact Number Tel: (65) 6791 7320

Mailing Address 50 Nanyang Avenue, S2-B4b-05
School of EEE, NTU, S639798

Website www.eee.ntu.edu.sg/research/sntl