

IEICE Overseas Representative Session

Ritsumeikan University

March 12, 2015

Singapore



A. Alphones, NTU, Singapore

Universities and Research Institutes in Singapore

- Nanyang Technological University
- National University of Singapore
- Singapore University of Design and Technology
- ASTAR (Agency for Science, Technology and Research)
 - Institute for Infocomm Research
 - Data Storage Institute
 - Institute of Microelectronics
 - Institute of Material Research and Engineering

INFINITUS

Infocomm Centre of Excellence

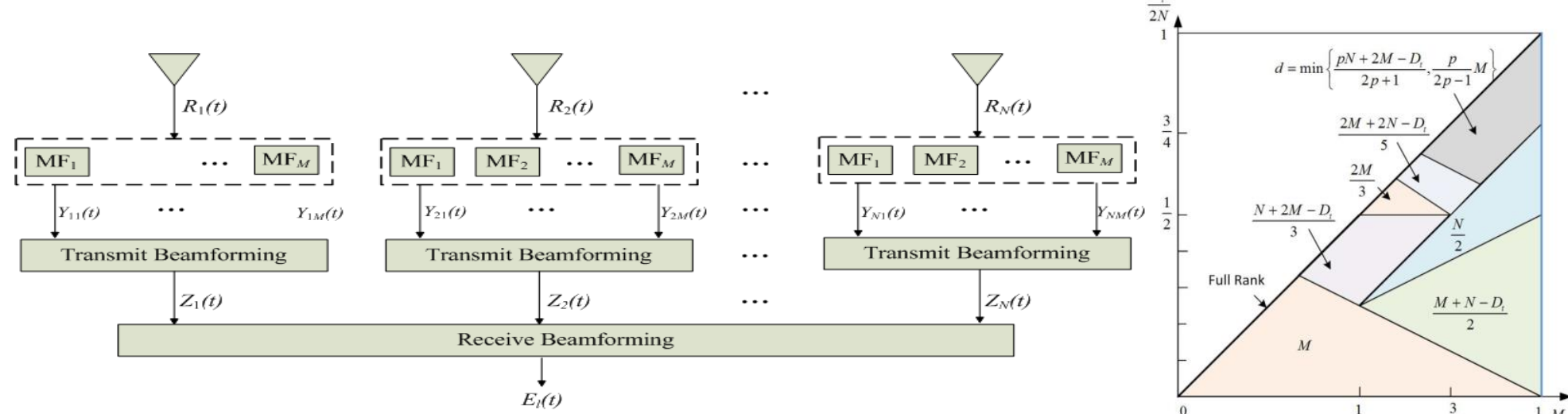
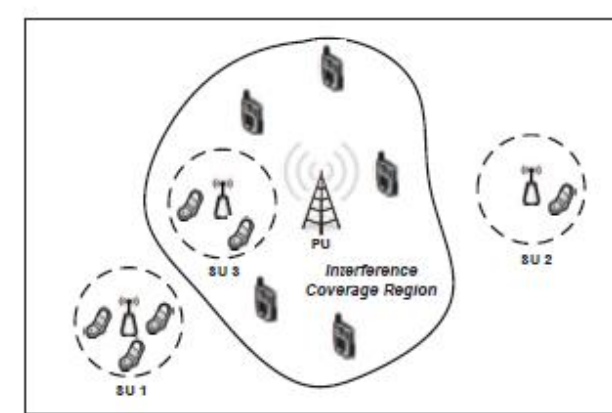
Seven Research Programs

- Communications and Network Systems:
- Navigation and Positioning:
- RF and Microwave:
- Security:
- Advanced Sensing:
- Data Mining and Analytics:
- Video Analytics:

Communications and Network Systems

Communications

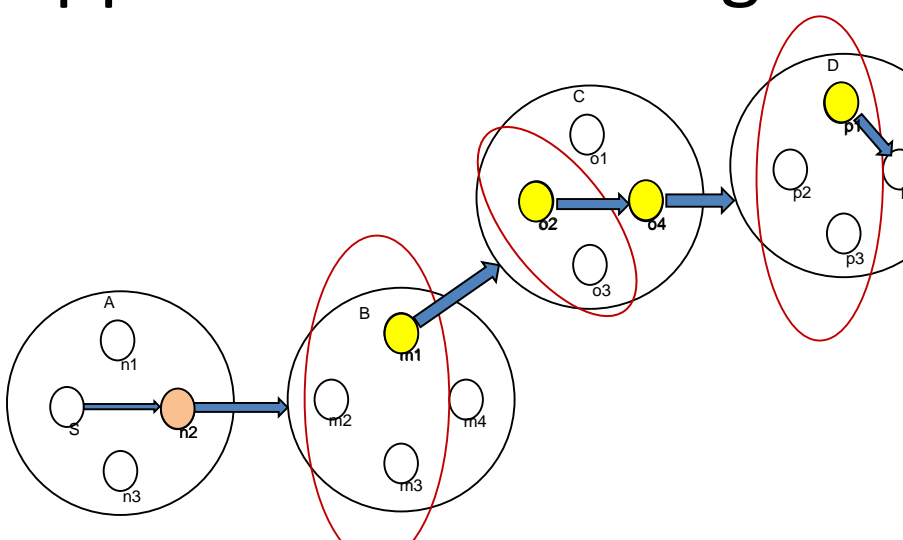
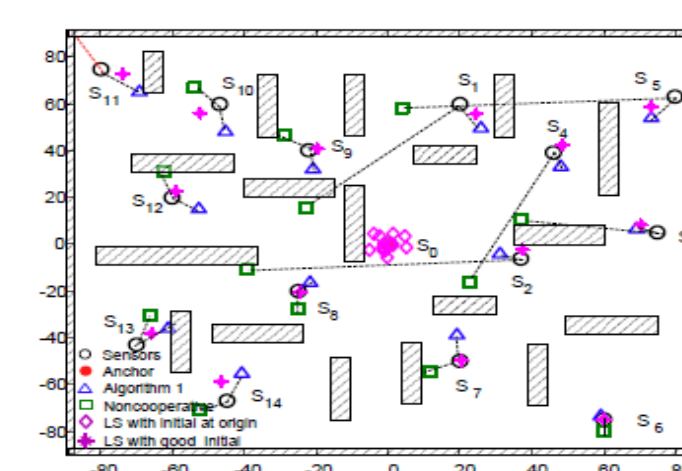
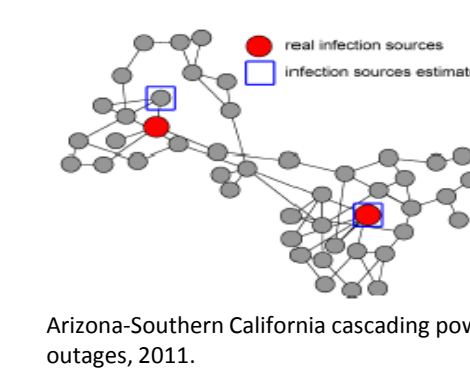
- Cognitive Radios
- MIMO Interference Channels
- MIMO Radar and STAP Processing



Communications and Network Systems

Network Systems

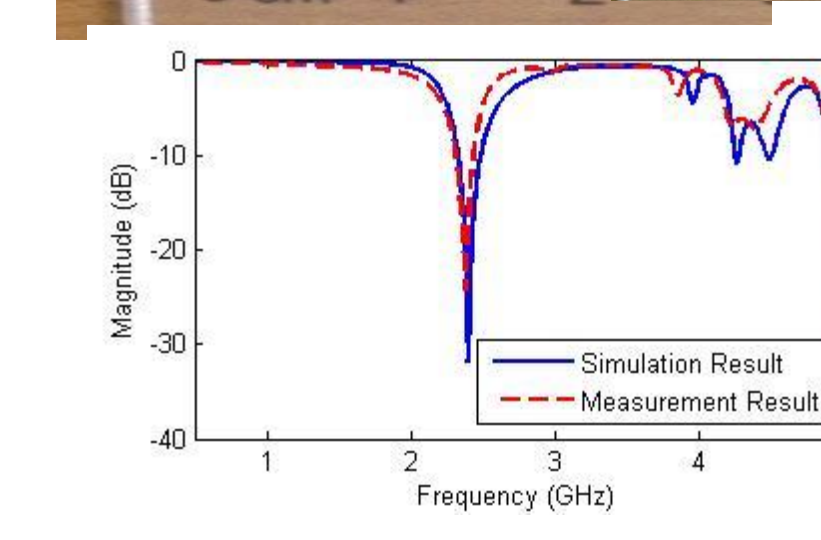
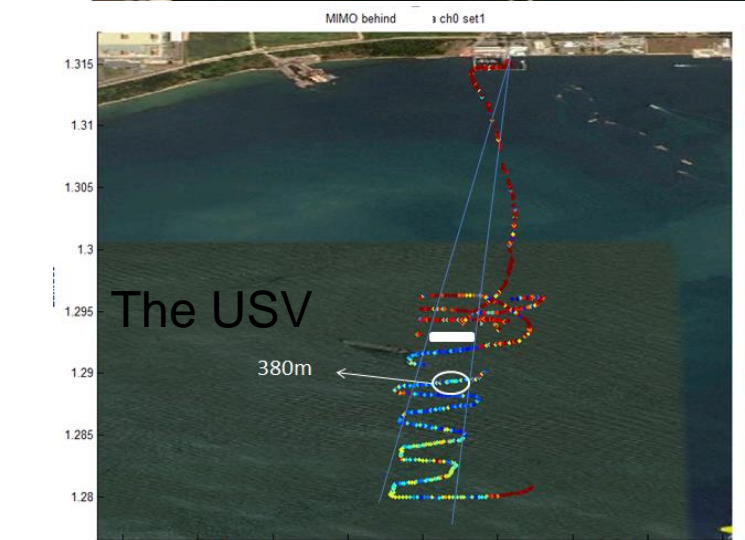
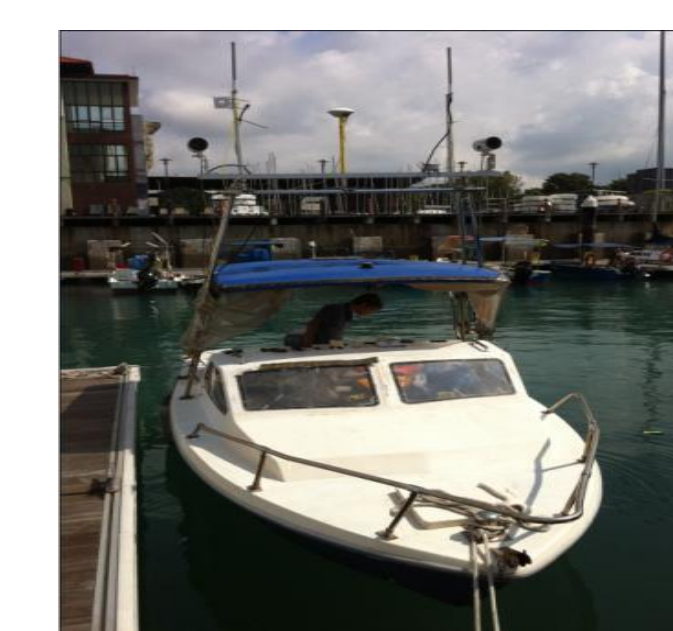
- Network Source Estimation
- Distributed and Cooperative Algorithms for WSN
- Distributed Dynamic Multi-radio Multi-channel Assignment for Opportunistic Routing in MANETS



EFFECT OF BIAS IN TDOA ESTIMATION

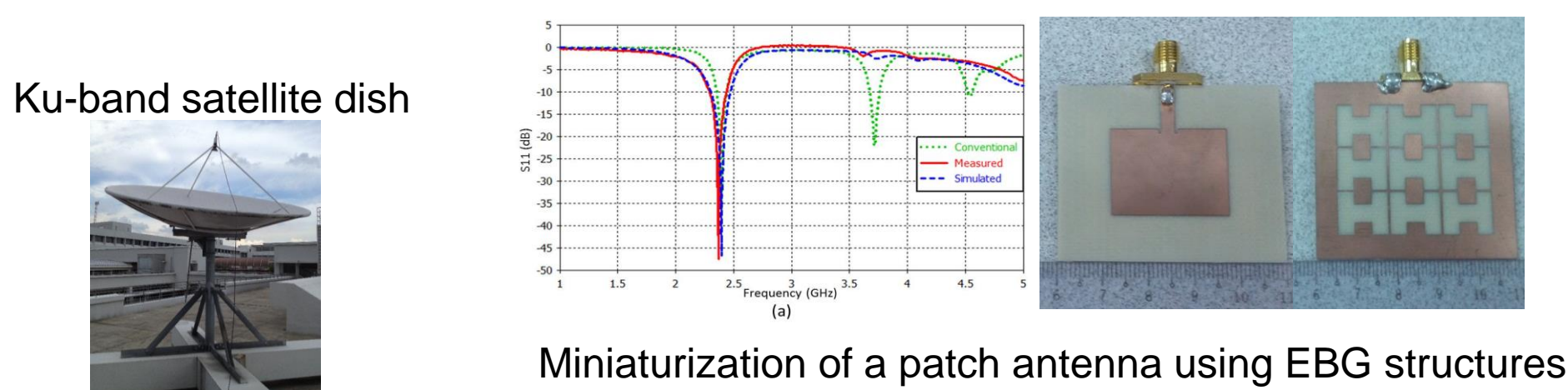
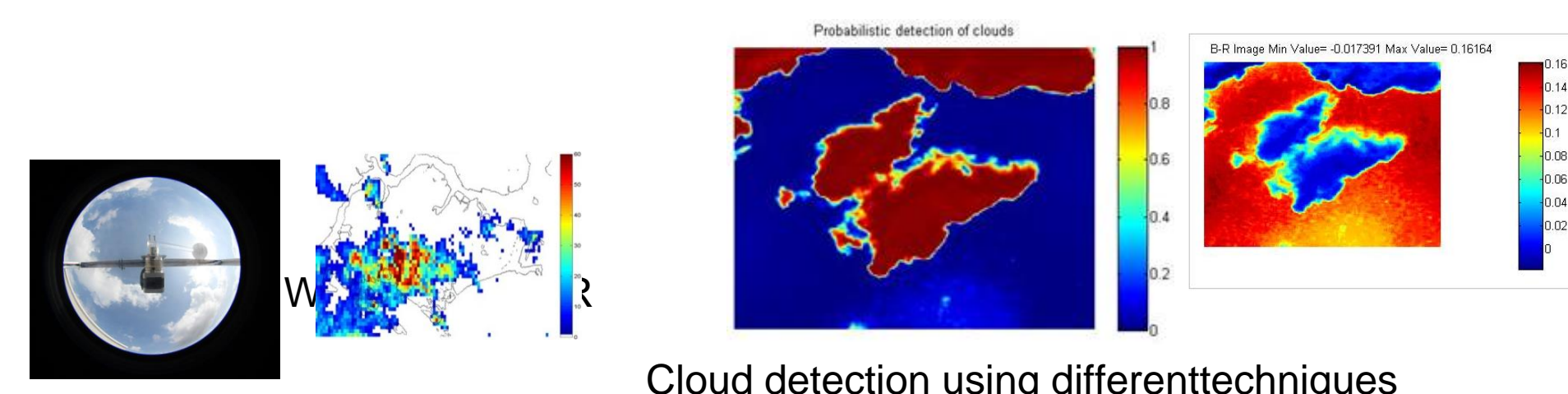
Approach	Estimate	RMSE with $\Omega_2 = 0$ and increasing Ω_1 in m/s				
		0	5	50	100	200
DTDOA	D_1 (m)	9.1855	9.2714	9.278	9.314	9.355
	v_1 (m/s)	0.453	0.456	0.455	0.457	0.462
TDOA	D_1 (m)	7.489	21.315	199.209	397.657	792.584
	v_1 (m/s)	0.343	1.160	11.056	22.026	43.648

RF and Microwave Engineering



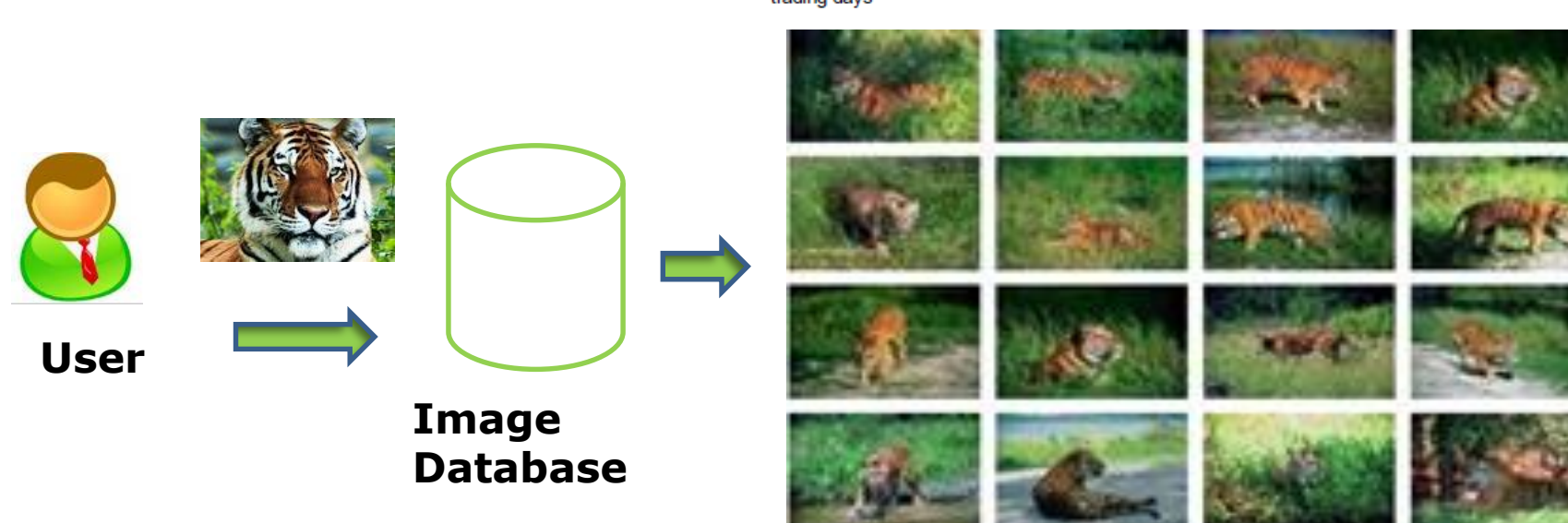
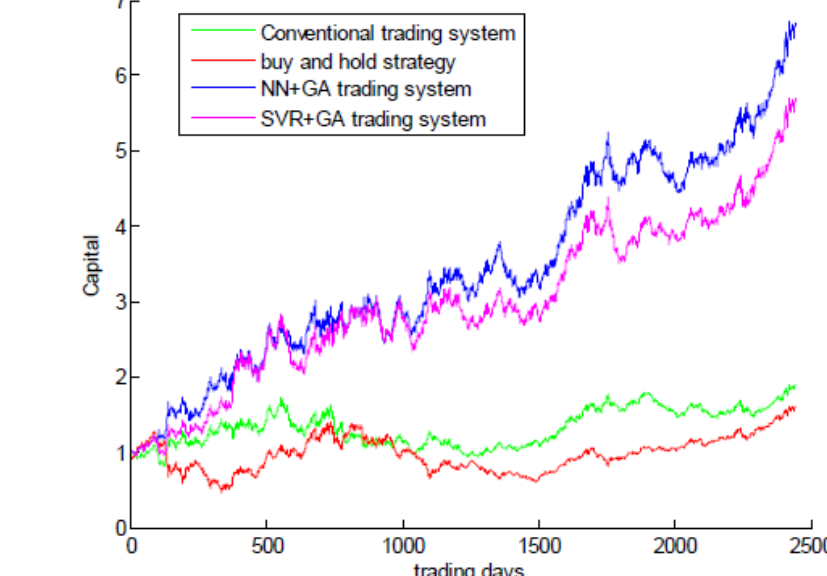
RF and Microwave Engineering

- Satellite and air to ground propagation through clouds



Machine Intelligence for Stock Trading and Image Retrieval

Stock Trading



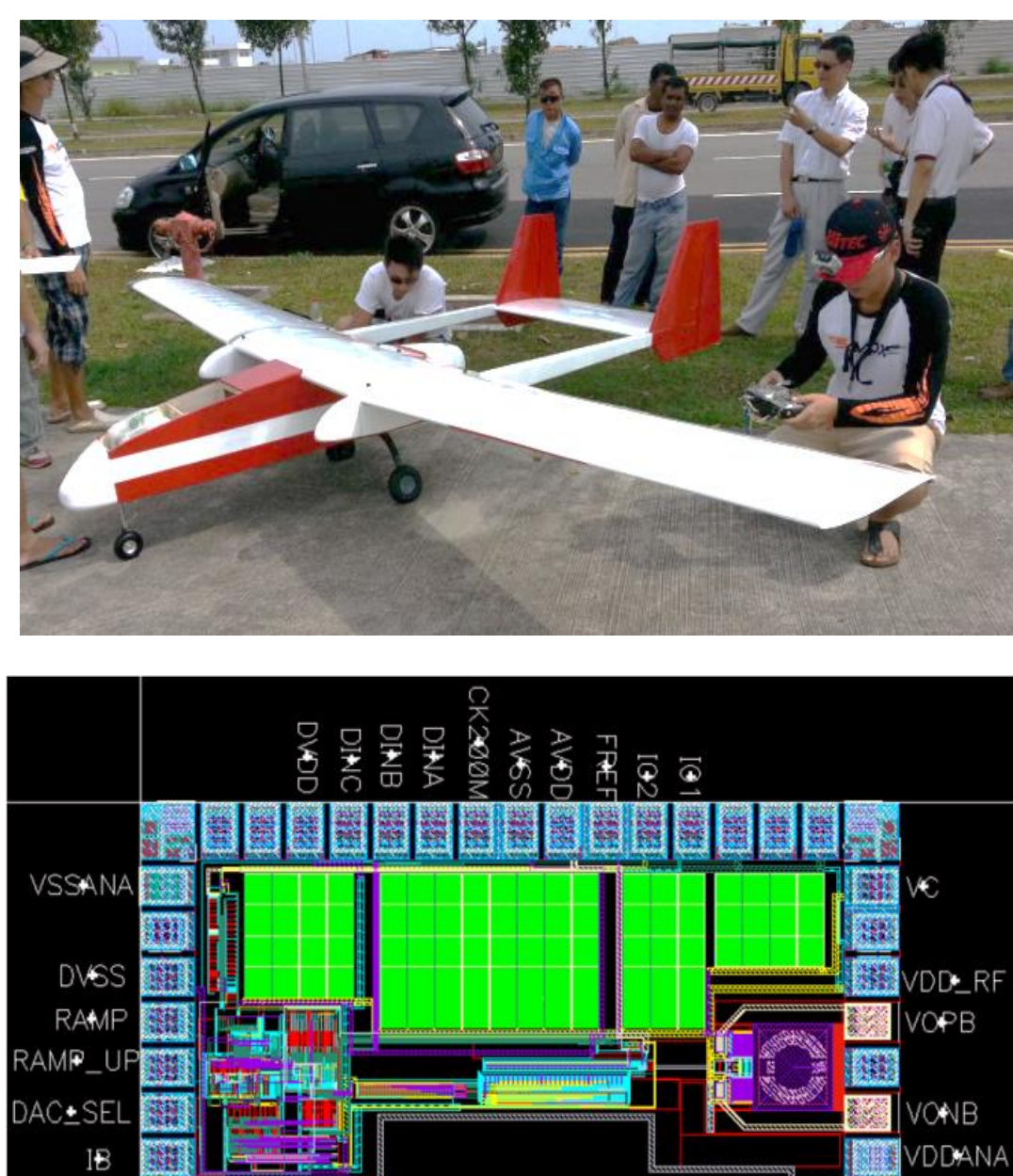
Video Analytics

- Research Focus
 - Video surveillance and anomaly detection
 - Human behavior analysis
 - Object detection, tracking and recognition
 - Context-based scene understanding
 - Large-scale video search, mining and summarization
 - Vision-based human computer interaction
 - Image/Video processing and coding



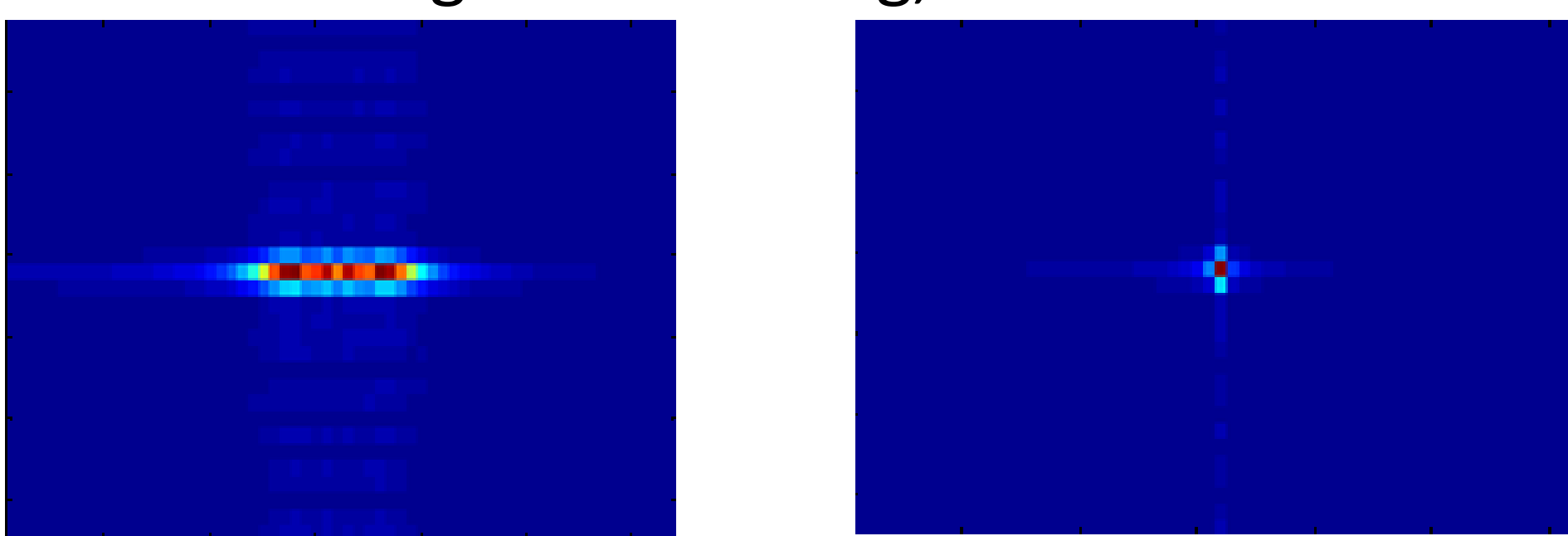
Advanced Sensing Program

- Focus Areas
- Current Project Highlights
 - SAR radar System-on-Chip
 - MIMO and MIMO-STAP Processing



Advanced Sensing Program

- Current Project Highlights
 - Compressed Sensing for GMTI Applications,
 - SAR Moving Target Imaging,
 - Spatial IIR Structure for RADAR Signal Processing,



Comms R&D plan moving forward

- 4G and Beyond Technologies
- Wireless Sensor Networks
- Machine-to-machine Communications
- Internet of Things (IoT)
- Smart Applications
- IPv6
- Cyber and Communication Security

VELOX-1

- A 5kg nano-satellite
- Built by NTU students
- A satellite pair comprising of a nano-satellite and a 1kg pico-satellite.



- Membership drive is being done at all IEICE/IEEE seminars organized at Singapore
- Various transactions of IEICE and their topics are briefed at each seminar
- Meet the industrial and academic researchers to have a better networking among them to have a joint workshop
- A joint international workshop between IEICE and Singapore on 30th and 31st Oct 2014, and the themes was on Smart Wireless Communication (Smartcom)

First Call for Papers

2014 Singapore-Japan International Workshop on Smart Wireless Communications

SmartCom2014

October 30-31, 2014, Institute for Infocomm Research (I²R), Singapore

<http://www.ieice.org/cs/sr/smartcom/>

SmartCom 2014 will be held at I²R located in Singapore, on October 30-31, 2014. This workshop will be organized and co-sponsored by the technical committee on Smart Radio of the Institute of Electronics, Information and Communication Engineers (IEICE), Advanced Communication Technology (ACT) FR, IEEE ComSoc Japan Chapter and IEEE VTS SG chapter.

Scope: SmartCom 2014 is a joint workshop between Singapore and Japan targeting smart wireless communication and covering radio technologies, spectrum management, wireless network, communication theory, and flexible hardware. Due to the recent wireless technology advancement, ubiquitous connection becomes familiar with everyone. However, this also leads to the tremendous growth of wireless data traffic, demanding for higher data rate. Therefore, smart communication technologies to address this data crunch are urgently desired. Its solutions are keys for a sustainable future wireless world. In this workshop, we discuss the solutions targeting not only near future but also years beyond 2020. Expected candidate solutions include small cell, heterogeneous networks including microwave/millimeter wave devices and, dynamic spectrum management, etc. The organizing committee wishes that the workshop provides a great opportunity for discussing a future wireless world and become an occasion to launch cooperative research and joint proposal to international standard.

Preferable Topics between Singapore and Japan sections

- Wireless Power Transfer
- Satellite Technology (specially on small satellite)
- Internet of Things (IoT)
- Terahertz Communications
- Smart Communications
- Cyber Security