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CONTACT
INFORMATION

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RESEARCH
INTERESTS

Data retrieval in constrained mobile networks, multimedia and sensor applications in smart devices, sensor based gesture recognition.

EDUCATION

National University of Singapore, Singapore
Department of Computer Science, School of Computing
  Ph.D., Computer Science, (January 2008 - September 2014)

- Thesis: "Resource Aware Selection of User Generated Content in Constrained Mobile Networks"
- Advisor: Prof. Chan Mun Choon
- CAP: 3.75/5

Visvesvaraya Technological University, Belgaum, India
Department of Computer Science and Engineering,
The National Institute of Engineering, Mysore, India
  Bachelor of Engineering, June, 2004

- Class: First Class with Distinction
- Aggregate: 73.8%

HONORS AND
AWARDS

NUS Research Scholarship, Awarded by National University of Singapore., January 2008 - December 2011
Best Technical Paper Award. Awarded by Mindtree Ltd., 2006
Spot Award (for outstanding performance). Awarded by Mindtree Ltd., 2005

PUBLICATIONS

Seshadri Padmanabha Venkatagiri, Mun Choon Chan, Wei Tsang Ooi, *Automated Link Generation For Sensor-Enriched Smartphone Images*, ACM Transactions on Multimedia Computing, Communications, and Applications (TOMM) Special Issue On Smartphone-based Interactive Technologies, Systems and Applications, 12, 1s, Article 13 (October 2015), 25 pages, 2015.

Seshadri Padmanabha Venkatagiri, Mun Choon Chan, Wei Tsang Ooi, JiaHan Chiam, *On Demand Retrieval of CrowdSourced Mobile Video*, IEEE Sensors Journal Special Issue On Distributed Smart Sensing for Mobile Vision, 2014.

Mukesh Saini, **Seshadri Padmanabha Venkatagiri**, Wei Tsang Ooi, Mun Choon Chan, *The Jiku Mobile Video Dataset*, ACM Conference On Multimedia Systems(MMSys), 2013.

Seshadri Padmanabha Venkatagiri, Mun Choon Chan, Wei Tsang Ooi, *Mobile-to-Mobile Video Recommendation*, In The 9th International Conference on Mobile and Ubiquitous Systems: Computing, Networking and Services (Mobiquitous), Beijing, People's Republic of China, December, 2012.

Pravein Govindan Kannan, **Seshadri Padmanabha Venkatagiri**, Mun Choon Chan, Akhihebbal L. Ananda, Li-Shiuan Peh, *Low Cost Crowd Counting using Audio Tones*, In The 10th ACM Conference on Embedded Networked Sensor Systems (SenSys), Toronto, Canada, November, 2012.

Faicheong Choo, **Seshadri Padmanabha Venkatagiri**, Mun Choon Chan, *Application-Aware Disruption Tolerant Network*, IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS), 2011.(Short paper)

PATENTS

Seshadri Padmanabha Venkatagiri, *Power management based on dynamic frequency scaling in computing systems*, US Patent Application. 11/277,151, 2006 (**Patent pending**).

DEMONSTRATIONS

- *Automated Link Generation For Sensor-Enriched Smartphone Images* at InnoFest 2014, IoT Asia 2015 and SeSaMe center workshop 2015.
- *On Demand Retrieval of CrowdSourced Mobile Video* at NUS-Tsinghua Extreme Search Centre workshop 2012/2013.
- *CountMe! - Low Cost Crowd Counting using Audio Tones* at HotMobile 2012, Wireless@MIT annual workshop 2012 and Singapore-MIT alliance Future Urban Mobility Workshop 2012.

TALKS

- ACM SenSys 2012, *Low Cost Crowd Counting using Audio Tones.*
- ACM Mobiquitous 2012, *Mobile-to-Mobile Video Recommendation* [Video recording].

ACADEMIC EXPERIENCE

Interactive and Digital Media Institute, National University of Singapore, Singapore

Post-doctoral Research Fellow	**April, 2015 - Present**
Post-doctoral Research Associate	**January, 2015 - March, 2015**
Research Assistant	**October, 2012 - December, 2014**

Research funded by Sensor-enhanced Social Media Centre (SeSaMe) and NUS-Tsinghua Extreme Search Centre (NExT). My contributions spans three projects with focus on applications of dedicated sensor deployments and/or on-board sensors in smart devices:

- *Gesture Recognition* Head pose estimation (HPE) is a fundamental operation in applications such as gesture recognition, human activity recognition, user attention estimation and actuation of devices/drones. Existing HPE techniques rely on cameras and computer vision techniques or expensive wearable solutions. This research involves developing a low-cost, low-power, multi-modal sensor head and torso pose estimation technique as an alternative to existing HPE, by utilizing cheap ultrasound, inertial measurement unit hardware and wearable static magnets. This technique could be potentially adapted to recognize other types of gestures also.
- *Sensor-assisted Person Re-identification* This project leverages motion sensors, WiFi and Bluetooth signatures from smart devices to assist camera networks to re-identify and track people within camera fields of view.
- *Sensor-enriched Multimedia Retrieval and Interaction* This research focuses on processing crowd-sourced mobile video and images, by temporal stitching of multi-view sensor-annotated videos, inter and intra scene clustering, and automatic linking of sensor-annotated images. Also involved in collection of the sensor-annotated mobile video (Jiku) and photo (Photosense) datasets. Both datasets are publicly available. This work could be support applications for user-media interaction, analytics, recommendation and surveillance.

School of Computing, National University of Singapore, Singapore

Research Assistant	**January - October, 2012**

Research funded by Singapore-MIT Alliance for Research and Technology (SMART) program. Focus of this project is in developing technology to improve commuter experience in smart cities. Following is the span of my work:
- Research into infrastructure-less, decentralized crowd estimation using audio tones
- Involved in deployment of passive infrared sensors and cameras to estimate crowds in NUS campus bus stops and buses, and development of low cost shuttle bus tracking, localization and arrival time estimation without GPS by leveraging WiFi access points available in NUS campus. This project also featured remote maintenance and monitoring of shuttle bus sensors

under network disruption, and acted as a delay-tolerant vehicular network testbed (testbed was initially developed as part of an internal department grant).
- Research into infrastructure-less information dissemination over intermittently connected mobile networks, by learning the application data dependencies.

Graduate Research Scholar   **January 2008 - September 2014**

Includes Ph.D. research, coursework and research/consulting projects. Short summary of important modules is given below:
- *CS6282 Topics in Computer Science III.* Covers queuing theory and probabilistic models for database/network systems. Project involved modelling reliability of fragmented packets in DTN.
- *EE6902 Computer Communication Networks.* Covers optimization, probabilistic modelling of networks. Project involved adapting spray-and-wait routing to packet fragmentation in DTN.
- *CS5248 System Support For Continuous Media.* Covers media streaming and related topics. Project involved implementing RTP/RTSP network streaming to QuickTime video player.
- *CS5223 Distributed Systems.* Covers distributed system concepts like, reliability, consistency, DHT. Project involved developing a multi-player gaming client and server.
- *CS5229 Advanced Computer Networks.* Covers TCP, Internet, router queueing strategies. Course projects include analysis of real TCP traffic and implementing RED queuing in NS-2 simulator.

PhD thesis work focuses on developing techniques to overcome power and bandwidth limitations in in-situ retrieval of sensor enriched User Generated Content (UGC), by leveraging features extracted from content and on-board sensors available in smart devices. In addition to developing the algorithms, the thesis work involved the following:
- Collection and publication of real-world datasets.
- Implementation and evaluation of three prototypes involving mobile client and server modules. Building prototypes involved use of Android SDK (sockets, media, sensors, multi-threading, bluetooth, power, 3G and WiFi API, WiFi ad-hoc mode), JNI, OpenCV, FFMPEG, HTML/PHP, Postgres DB.
- Field work to measure the 3G and WiFi mobile bandwidth and power consumption, across Singapore. Power monitor hardware to make power measurements of smart devices.

Teaching Assistant   **August - December, 2010**

Duties included designing programming assignment, teaching, attending student inquiries, evaluating projects and grading the students. Received teaching score of 3.97/5 for CS2105 (Introduction to Computer Networking, Semester 1, 2010/11).

PROFESSIONAL EXPERIENCE

Mindtree Ltd, Bengaluru, India

Senior Engineer   **January, 2006 - December, 2007**
Programmer Analyst   **September, 2004 - December, 2005**

Designed and developed software modules for following projects:
- GENIE (General Electric Non-Destructive testing library for Image Evaluation) library. Co-ordinated with GE Industrial Imaging Lab during project lifecycle. GENIE is used by General Electric Corporation for Non-destructive testing of metallic parts.
- Server based web conferencing product for ClearOne. Product works over Internet, and is similar to GoMeetNow, NetMeeting, and VNC.
- Electronic channel guide feature for HomeTv product of Hillcrest labs.

COMPUTER SKILLS
- **Programming Languages** Java/JNI, C/C++, Matlab, HTML/PHP/Javascript, Shell/Awk.
- **Software Platforms** Android, Arduino, Linux, Windows.
- **Libraries** OpenCV, OpenGL, OpenNI, FFMPEG, NodeJS, sockets (low-level API, volley library) and multi-threading (pthread and Java) libraries, Postgres and SQLite database libraries.
- **Specialized Hardware Platforms** Raspberry Pi, Arduino Yun/Blend Micro, Power Monitor, AR Drone 2.0, Crazyflie drone 2.0. Also amatuer experience in building custom drones.

- **Sensors** MaxBotic ultrasound sensors, Pololu IMU sensors, GPS, Motion sensors, MindWave EEG sensor, IP Cameras, Structure and Kinect depth sensors.
- **Version management** Familiar with SVN, WinCVS, Perforce, Git, VSS.
- **Documentation** Latex, MS Office, GNUPlot, Gimp, Irfanview.

MISCELLANEOUS
PROJECTS

- Drone programming for human-drone interaction, amateur DIY drone making
- Involved in design and implementation of a RPi and Arduino sensor (depth, environment, IMU and motion) based dependent monitoring system to monitor infants and elderly, for the Singapore IoT Hackathon 2015.

PERSONAL
INTERESTS

- Writing blog articles on military history, geo-politics, technology and philosophy.

REFERENCES

Prof. Chan Mun Choon, Associate Professor
School of computing, National University of Singapore, Singapore.
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Website: https://www.comp.nus.edu.sg/~chanmc/

Prof. Ooi Wei Tsang, Associate Professor
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Prof. Li-Shiuan Peh, Professor
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