

Viet NGUYEN

Ph.D. Candidate

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Research interests

Mobile Vision, Visible Light Communication and Sensing, Pervasive Mobile Systems, Human-Computer Interaction.

Education

- 2013 - present **Ph.D. Computer Engineering**, *Rutgers University*, North Brunswick, NJ, USA.
- 2009 - 2011 **B.S. Information Science and Technology**, *Ritsumeikan University*, Shiga, Japan.
- 2006 - 2009 **Computer Science**, *Hanoi University of Technology*, Hanoi, Vietnam. *Transferred to Ritsumeikan University.*

Research Experience

- Visible Light Indoor Localization using Ceiling Photosensors** Develop a localization system in which photosensors deployed on the ceiling detect the change in light level caused by human shadow.
Build light sensor frontend, signal processing embedded system and backend server.
- Mobility-Aware Virtual Views for Steerable Cameras** Develop camera recording system for PTZ IP cameras, using OpenCV and libvlc.
Develop several computer vision algorithms using OpenCV, including background subtraction, vehicle and pedestrian counting, license plate recognition (using OpenALPR).
- Flicker-Free Screen-Camera Communication** Propose spatial content-adaptive encoding for screen-camera communication to achieve both high capacity and minimal flicker.
Develop content-adaptive encoding techniques that exploit visual features such as edges and texture to unobtrusively communicate information.
- Privacy Respecting Cameras** Explore the use of near-visible/infrared light communication to design “invisible light beacons” where privacy preferences of photographed users are communicated to cameras.
Experiment with a design where the beacon transmitters are worn by users on their glasses and transmit privacy codes through ON-OFF patterns of light beams from IR LEDs.

Publications

- IPSN 2017 Shubham Jain, **Viet Nguyen**, Marco Gruteser, Paramvir Bahl.
Panoptes: Servicing Multiple Applications Simultaneously using Steerable Cameras, ACM/IEEE IPSN 2017: The 16th International Conference on Information Processing in Sensor Networks, Pittsburgh, Pennsylvania.
- VLCS 2016 Mohamed Ibrahim, **Viet Nguyen** (co-first author), Siddharth Rupavatharam, Minitha Jawahar, Marco Gruteser, Richard Howard.
Visible Light based Activity Sensing using Ceiling Photosensors, 3rd ACM Workshop on Visible Light Communication Systems (VLCS) 2016, New York City
Best Paper Award
- INFOCOM 2016 **Viet Nguyen**, Yaqin Tang, Ashwin Ashok, Marco Gruteser, Kristin Dana, Wenjun Hu, Eric Wengrowski, Narayan Mandayam.
High-Rate Flicker-Free Screen-Camera Communication with Spatially Adaptive Embedding, in Proceeding of IEEE Conference on Computer Communications (INFOCOM) 2016.
Best-in-session Presentation Award
- VLCS 2014 Ashwin Ashok, **Viet Nguyen**, Marco Gruteser, Narayan Mandayam, Wenjia Yuan, Kristin Dana.
Do not share! Invisible Light Beacons for Signaling Preferences to Privacy-Respecting Cameras, in Proceeding of ACM Workshop, VLCS Workshop, 2014, Maui, Hawaii.
- MC2R **Viet Nguyen**, Marco Gruteser
First Experiences with Google Glass in Mobile Research, in *Get Mobile - Mobile Computing & Communications Review* - October 2014.

Projects

- Small OS container** Implement basic components of an OS container: a task scheduler, a memory management unit, and a file system. This is a part of OS Design course at Rutgers CS Department.

Artificial Intelligence & Machine Learning algorithms As parts of the Introduction to Artificial Intelligence course at Rutgers CS Department, implement several AI & Machine Learning algorithms in C++ and Python. Algorithms implemented: A* search, Perceptron, Naive Bayes, MIRA.

Computer Vision Algorithms Implement several Computer Vision algorithms in Matlab, as parts of the Computer Vision course at Rutgers CS Department. Algorithms implemented: Optical Character Recognition, Texture Synthesis and Image Inpainting, Camera Calibration and Augmented Reality.

CDN Simulator Implement a simple simulator of a Content Delivery Network model in C++. This is a part of the Communication Network II course at Rutgers ECE Department.

Teaching

Fall 2016 **ECE 563** - Computer Architecture I (Grad Level)

Fall 2015 **ECE 233** - Digital Logic Design Lab

Spring 2015 **ECE 333** - Computer Architecture and Assembly Language Lab

Fall 2013 **ECE 347** - Linear Systems and Signals Lab

Awards

Fall 2016 Best Paper Award - ACM VLCS Workshop 2016

Spring 2016 Best-in-Session Presentation Award - IEEE INFOCOM 2016

Spring 2016 Student Travel Grant - IEEE INFOCOM 2016

Spring 2016 Rutgers TA/GA Professional Development Fund

Employment

Summer 2016 **Research Intern**, Samsung Research America, Richardson, TX.

Video Analysis for Smart Building Control Implement a video analysis algorithm to count number of people and detect their activities from CCTV camera feed.

Train a classifier to detect human heads in camera view and track them during the course of the video stream.

2011 - 2013 **Software Engineer**, Viettel Research & Development Institute, Hanoi, Vietnam.

Antenna Coverage Simulation Software Design a C++ core library to calculate antenna coverage over a specific area from terrain height information of digital map.

Develop a 3D display module to visualize antenna coverage area on the digital map, using ArcGIS simulation engine and Microsoft Visual C#.

Analog to digital Converter for radars Develop central components on ARM microcontrollers that synchronize and control other components, which handle different types of input signals.

Design the common message format for communication protocol, state machine and interrupt handling mechanism.

Skills

Programming languages: C, C++, C#, Java, Python, MATLAB, Haskell.

Mobile applications: Android development.

Network: Familiar with TCP/IP network protocols.

Embedded Systems and Electronics: Experience with microcontroller programming: ARM, AVR, MSP430, MSP432. Familiar with electronics prototyping and testing equipments (oscilloscope, function generator, power supply, etc.)

Computer Vision: OpenCV, Matlab Computer Vision toolbox.

Other tools: Ubuntu Linux, Cygwin, BASH scripting, Emacs, Visual Studio, Code Composer Studio.

Coursework

Stochastic Signals and Systems, Communication Network I, Communication Network II, Design and Analysis of Data Structures and Algorithms, System Analysis, Computer Vision, Introduction to Artificial Intelligence, Topics in Mobile Computing, Convex Optimization, Operating Systems Design.

Reference

Marco Gruteser Professor,
Department of Electrical and Computer Engineering
Rutgers University.

**Narayan
Mandayam** Professor,
Department of Electrical and Computer Engineering
Rutgers University.

Kristin Dana Professor,
Department of Electrical and Computer Engineering
Rutgers University.