Avinash Kalyanaraman

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Education

PhD in Computer Science, *Jan 2014 - Dec 2019*
University of Virginia, Charlottesville.
Advisor: Prof. Kamin Whitehouse

Master's in Computer Science, *Aug 2010 - Sep 2012*
University of Virginia, Charlottesville.
Advisor: Prof. Andrew Grimshaw

B.E. in Computer Science & Engineering, *Aug 2006 - May 2010*
College Of Engineering Guindy, Anna University, India

Experience

Cisco Systems, Office of the CTO : Software Research Engineer *May 2020 - Present*
My role involves exploration and building the technologies of tomorrow that can simplify and improve the way we work and operate in enterprise buildings. I work in the areas of AR/VR, indoor localization and confidential computing.

University of Virginia : Graduate Research Assistant *Jan 2014 - Dec 2019*
My research spans the areas of Internet of Things, wireless systems, applied machine learning, and mobile computing. In particular, I build wireless sensing solutions that apply machine learning techniques to create smarter environments that improve the quality of our lives. These systems leverage wireless signals to infer the context of the environment, and is primarily applicable in smart-buildings and smart automobiles.

NEC Labs, Princeton : Research Intern *May 2019 - Aug 2019*
I researched the feasibility of (through the wall) sensing of entrapped humans during emergencies such as a fire via wireless radar devices mounted on drones that scout the building.

Bosch Research, Sunnyvale : Research Intern *Oct 2018 - Mar 2019*
I researched the usage of the pre-existing wireless infrastructure in modern automobiles as a sensing modality to infer context inside the car.

University of Massachusetts, Amherst : Visiting Researcher *Mar 2018 - May 2018*
I researched the feasibility of using off-the-shelf RFID devices for vital signs monitoring, and their applicability as a possible biometric.

PacketZoom : Software Engineer *Jun 2013 - Dec 2013*
Developer for the PacketZoom transport protocol and proxy. They were designed to accelerate network access of mobile applications by overcoming the shortcomings of TCP.

Zynga : Software Engineer *Oct 2012 - Jun 2013*
Member of Zynga Platform Team which designed and developed the framework for Zynga's backend services. I was also involved in evaluating storage systems and moving social network data to NoSQL data-stores like HBase and Cassandra.

University of Virginia : Graduate Research Assistant *Sep 2010 - Sep 2012*
Researcher and Developer for the Genesis II grid-OS (software component of XSEDE, a national cyber-infrastructure)

National e-Science Centre, Glasgow : Summer Research Student *May 2009 - Aug 2009*
Developed MapReduce algorithms for the analysis of large linguistic datasets on UK's National Grid.

Publications

Conference

1. **A. Kalyanaraman**, Y. Zeng, S. Rakshit, V. Jain. *Caraokey : Car States Sensing via the Ultra-Wideband Keyless Infrastructure* Accepted in SECON 2020 (Best Paper Runner-Up).

2. **A. Kalyanaraman**, E. Soltanaghaei, K. Whitehouse. *Doorpler : A Radar-based System for Low Power, Real-time Zone Occupancy Sensing.* Accepted in RTAS 2019

3. E. Soltanaghaei, **A. Kalyanaraman**, K. Whitehouse. *Multipath Triangulation: Decimeter-level WiFi Localization and Orientation with a Single Unaided Receiver.* Accepted in MobiSys 2018.

4. **A. Kalyanaraman**, Dezhi Hong, E. Soltanaghaei, K. Whitehouse. *FormaTrack: Tracking People based on Body Shape.* Accepted in UbiComp 2017 (ACM IMWUT Vol 1 Issue 3) (One-shot acceptance : 8%).

5. **A. Kalyanaraman**, E. Griffiths, K. Whitehouse. *TransTrack: Tracking Multiple Targets by Sensing their Zone Transitions.* Accepted in DCOSS 2016.

6. **A. Kalyanaraman**, A. Grimshaw. *Cabinet: Managing Data Efficiently in the Global Federated File System.* Accepted in IEEE e-Science 2013.

Journal

1. E. Griffiths, **A. Kalyanaraman**, J. Ranjan, K. Whitehouse. *An Empirical Design Space Analysis of Doorway Tracking Systems for Real World Environments.* Accepted in ACM Transactions on Sensor Networks (TOSN), 2017.

2. A. Grimshaw, M. Morgan, and **A. Kalyanaraman**. *GFFS –the XSEDE Global Federated File System.* Accepted in Parallel Processing Letters, 2013.

Workshop

1. E. Soltanaghaei, **A. Kalyanaraman**, K. Whitehouse. "Peripheral WiFi Vision: Exploiting Multipath Reflections for More Sensitive Human Sensing". The 4^{th} Workshop on Physical Analytics (WPA), 2017 (MobiSys 2017 Workshop).

2. **A. Kalyanaraman**, K. Whitehouse. *An event-based data fusion algorithm for smart cities.* The 1^{st} International Workshop on Smart Cities: People, Technology and Data, 2015 (UbiComp 2015 Workshop)

Poster

1. E. Soltanaghaei, **A. Kalyanaraman**, K. Whitehouse. "Improving Multipath Resolution with MIMO Smoothing". Accepted in MobiCom 2017.

2. E. Soltanaghaei, **A. Kalyanaraman**, K. Whitehouse. "Occupancy State Detection using WiFi signals". Accepted in MobiSys 2017 (also Best Poster Award at N2 Workshop).

3. **A. Kalyanaraman**, J. Ranjan, K. Whitehouse *Automatic rock climbing route inference using wearables.* Accepted in UbiComp 2015.

4. **A. Kalyanaraman**, B. Reeder, and K. Whitehouse. *Benefits and Challenges of a Height Sensing Approach for In-Home Gait Speed Detection* at the American Medical Informatics Association (AMIA) Annual Symposium, 2014.

5. Ashoke S, **A. Kalyanaraman**, Pragadeesh R, A P Shanthi *FBGA : An FPGA Based Grid Architecture'.* Accepted in HiPC, Student Research Symposium, 2009.

6. R.O. Sinnott, M. Sarwar, **A. Kalyanaraman**, J.G. Anderson, M. Alexander, J. Greene *"Supporting the Language and Literature Research Community through e-Infrastructures".* Accepted in AHM e-Science Conference, 2009.

Patents

1. D.Maluf, H. Tran, **A. Kalyanarman**, P. Polakos *"Correcting For Antennae Spatial Distortions in Radio Frequency (RF) Localizations"* (Filed: May 2022)

2. E. Voit, P. Kathail, **A. Kalyanarman** *"Verifying trust postures of heterogeneous Confidential Computing clusters"* (Oct 2022) (Application #: 17/583,284).

3. Y. Zeng, **A. Kalyanaraman**, S. Rakshit, V. Jain *"Ultra-wideband Intelligent Sensing System and Method for Car States Detection"* (Oct 2020) (Application #: 16/368,994).

Technical Skills

Languages: C, C++, Java, Python, Shell script, SQL, Matlab

Wireless: GNU-Radio, USRP, Xethru RADAR, Walabot, Intel 5300, Impinj RFID, DW 1000

Others: Android Wear, Pandas, TI MSP432, Intel VTune, YourKit Profiler, Git, SVN, Eclipse, Apache Derby

Service

- TPC member of ACM COMPASS 2022
- TPC member of PerCom 2022 Industry Track
- TPC member of SmartComp 2022 Industry Track
- TPC member of IEEE International Conference on Assured Autonomy (ICAA) 2022
- TPC member of PerCom 2021 Industry Track
- TPC member of SmartComp 2021 Industry Track
- TPC member of IEEE Workshop on Assured Autonomous Systems 2020 (co-located with S&P'20)
- TPC member of ACM S3 Workshop 2019 (co-located with MobiCom'19)
- Invited Reviewer for UbiComp (IMWUT), IoTDI, PerCom, COMSNETS, ACM Transactions on Sensor Networks, ACM Transactions on CyberPhysical Systems, IEEE Transactions on Communications, IEEE Sensors, AMIA Annual Symposium, EURASIP Journal on Wireless Communications and Networking.

Misc

- Finalist, University of Virginia Engineering Research Symposium (UVERS), 2018.
- Finalist of UVA iLabX 2017. Selected from Engineering School based on commercial viability of research.
- Demo-ed the Global Federated File System and Genesis II at SuperComputing 2011 (SC, 2011).
- Attended the 3^{rd} International Winter School on Grid Computing (IWSGC).
- Member of Charlottesville Cricket Club (2012, 2014-2019). Appointed Vice captain (2014 - 2016). Selected to represent Virginia (2016).
- Avid quizzer having won over 50 quizzes- including winning Tata Crucible, Chennai, 2010