

Eyuphan Bulut

CONTACT INFORMATION	Department of Computer Science Virginia Commonwealth University https://ebulutvcu.github.io	401 West Main St, Richmond, VA 23284 <i>Phone:</i> (804) 828-6382 ebulut@vcu.edu
RESEARCH INTERESTS	Mobile and wireless networks: Cyber-physical systems, Internet-of-Things (IoT), UAV networks, crowd-sensing, wireless/WiFi sensing, mobile social networks, wireless charging, edge based machine/deep learning; Security: Wireless/mobile network security, privacy and trust management, cybersecurity, secure mobile/pervasive sensing, iOS/Xcode development; Mobile cellular systems: NextG/5G networks, mobile core network, data offloading.	
EDUCATION	Ph.D. , Computer Science, May, 2011 Rensselaer Polytechnic Institute , Troy, NY USA Advisor: Prof. Boleslaw K. Szymanski Thesis: Opportunistic Routing Algorithms in Delay Tolerant Networks M.S. , Computer Engineering, May, 2007 Bilkent University , Ankara, Turkey B.S. , Computer Engineering, May, 2005 Bilkent University , Ankara, Turkey	
ACADEMIC AND INDUSTRIAL EXPERIENCE	Virginia Commonwealth University , Richmond, VA <i>Associate Professor of Computer Science</i> Virginia Commonwealth University , Richmond, VA <i>Assistant Professor of Computer Science</i> Air Force Research Lab (AFRL) , Rome NY <i>Summer Visiting Faculty</i> Cisco Systems , Richardson, TX <i>Senior Engineer</i> (in Mobile Internet Technology Group (MITG)) IBM T.J. Watson Research Center , Hawthorne, NY <i>Research Intern</i> (worked at Army Research Lab, Adelphi, MD for collaboration) Rensselaer Polytechnic Institute , Troy, NY USA <i>Research and Teaching Assistant</i> Bilkent University , Ankara, Turkey <i>Research and Teaching Assistant</i>	July 2020 - present Sept 2015 - June 2020 June 2019 - Aug 2019 June 2011 - Sept 2015 Aug 2010 - Nov 2010 Aug 2007 - May 2011 Sept 2005 - May 2007
FUNDED RESEARCH PROJECTS	Total Funding: \$3.1M (My share: \$1.5M) [G1] NSF US Ignite program: \$396,000 (2017-2021) “ <i>Rapid and Resilient Critical Data Sourcing for Public Safety and Emergency Response</i> ” Lead PI: <u>Eyuphan Bulut</u> , coPI: Milos Manic (Total \$616,000 including UCF share) [G2] NSF CNS (NeTS) program: \$228,500 (2018-2023) “ <i>Collaborative Research: Improving Spectrum Efficiency for Hyper-Dense IoT Networks</i> ” PI: <u>Eyuphan Bulut</u> (Total \$566,000 including GATech and NCSU shares)	

- [G3] **Air Force Research Lab (Extension grant):** \$10,000 (09/2019-11/2019)
“Reinforcement Learning based Autonomous UAV Swarm Path Planning in Dynamic and Uncertain Environments”
Sole PI: Eyuphan Bulut
- [G4] **Idaho National Laboratory - Wireless Security Institute:** \$20,000 (05/2020-08/2020)
“Vehicle-to-Vehicle Security in 5G Systems”
Sole PI: Eyuphan Bulut
- [G5] **VCU Presidential Research Quest Fund (PERQ):** \$50,000 (07/2020-12/2021)
“Device-Free WiFi Sensing based Occupancy Detection in Buildings”
Sole PI: Eyuphan Bulut
- [G6] **Commonwealth Cyber Initiative (CCI) - Central VA Node:** \$300,000
(08/2020-07/2021) (my share - \$75k)
“Cyber and Physically Secure Communities: Resilient, Sustainable, Energy Efficient Smart Cities”
PI: Milos Manic, coPI: Eyuphan Bulut, Irfan Ahmed, Changqing Luo
- [G7] **Commonwealth Cyber Initiative (CCI) - Central VA Node:** \$50,000
(06/2021-05/2022)
“Experimenting Aggregated IoT 5G Communication through IMSI Sharing”
Sole PI: Eyuphan Bulut
- [G8] **Commonwealth Cyber Initiative (CCI) - Central VA Node:** \$100,000
(09/2021-05/2023) (my share - \$30k)
“Smart Wireless Attack and WiFi Sensing via Intelligent Reflecting Surface”
PI: Yanxiao Zhao, coPI: Eyuphan Bulut, Changqing Luo
- [G9] **VCU School of Nursing** \$19,350 (02/2022-02/2023) (my share - \$13k)
“WiFi Sensing-Based Device-Free Daily Activity and Mobility Recognition for Older Adults”
PI: Jane Chung, coPI: Eyuphan Bulut, Ingrid Pretzer-Aboff
- [G10] **NSF REU program** \$396,942 (03/2021-02/2024)
“REU Site: End-User Programming of Cyber-Physical Systems”
PI: Kostadin Damevski, Senior Personnel: Eyuphan Bulut, Bridget McInnes
- [G11] **Idaho National Laboratory - Wireless Security Institute:** \$110,000 (05/2022-08/2023)
“Identifying V2X Security Vulnerabilities in Untrusted 5G Networks”
Sole PI: Eyuphan Bulut
- [G12] **Commonwealth Cyber Initiative (CCI) - Central VA Node:** \$50,000
(08/2022-07/2023) (my share - \$40k)
“Secure Mobile (iOS) Programming through Experiential Learning”
PI: Eyuphan Bulut, coPI: Tunesha Witcher (VUU)
- [G13] **Commonwealth Cyber Initiative (CCI) - Central VA Node:** \$30,000
(09/2022-02/2024)
“Wireless Smart Home Intrusion Detector”
Sole PI: Eyuphan Bulut
- [G14] **NSF IUCRC program:** \$19,999 (04/2023-03/2023)
“IUCRC Planning Grant VCU: Center for Wireless Innovation towards Secure, Pervasive, Efficient and Resilient Next G Networks (WISPER)”
PI: Erdem Topsakal, coPI: Eyuphan Bulut, Tamer Nadeem, Irfan Ahmed
- [G15] **PennAITech (NIH funded center)** \$150,000 (06/2023-05/2024) (my share - \$59k)
“A Device Free WiFi Sensing System to Assess Daily Activities and Mobility in Low-Income Older

Adults With and without Cognitive Impairment”
 mPIs: Jane Chung, mPI: Eyuphan Bulut, Ingrid Pretzer-Aboff

[G16] **CHRB: Commonwealth Health Research Board** \$269,000 (07/2023-06/2025) (my share - \$90k)

“iTREAT – Improved Treatment using Advanced Technologies”

PI: Peter Pidcoe, coPI: Eyuphan Bulut

[G17] **Commonwealth Cyber Initiative (CCI)** \$100,000 (06/2023-05/2024) (my share - \$80k)
“CyberMobile: Secure Mobile (iOS) Development through Experiential Learning”

Lead-PI: Eyuphan Bulut, coPI: Tunesha Witcher (VUU)

[G18] **Commonwealth Cyber Initiative (CCI)** \$100,000 (06/2023-05/2024) (my share - \$50k)
“Low-cost and Long-lasting Soil Moisture Sensing with WiFi signals and Energy Harvesting”

Lead-PI: Eyuphan Bulut, coPI: Brad Campbell(UVA)

[G19] **Gift from Athena Security** \$25,000

PI: Eyuphan Bulut

[G20] **Parkinson’s and Movement Disorders Center** \$50,000 (09/2024-08/2024) (my share - \$45k)

“At-Home Monitoring of PD Patients through Non-Invasive WiFi Sensing”

PI: Eyuphan Bulut, coPI: Brian Berman

[G21] **Commonwealth Cyber Initiative (CCI)** \$100,000 (08/2024-07/2025) (my share - \$40k)
“Understanding the Vulnerability of Cyber-Physical Systems with Attack Paths Analysis with its Evaluation in UAV-IoT Networks”

Lead-PI: Jundong Li (UVA), coPI: Eyuphan Bulut

IMPACT OF
PUBLICATIONS

Total citations: 3320 (from Google Scholar - as of 9/24)
 h-index: 32
 i-index: 67

COURSES TAUGHT

CMSC 401: Algorithm Analysis with Advanced Data Structures (*Fall 2016, Fall 2017, Fall 2018, Fall 2019, Fall 2020, Fall 2021, Fall 2022, Fall 2023, Fall 2024*) with classes of 80-160 students
CMSC 428: Mobile (iOS) Programming (*Spring 2016, Spring 2017, Spring 2018, Spring 2020, Spring 2022*) with classes of 30-40 students
CMSC 628: Mobile Networks (*Spring 2019, Spring 2021, Spring 2023, Spring 2024*) with classes of 15-20 students

JOURNAL
PUBLICATIONS

Graduate student (g) and undergraduate student (u) authors mentored by Dr. Bulut.
 (*) denotes corresponding author if not last author.

[J31] M. Touhiduzzaman(g), S. M. Hernandez(g), P. E. Pidcoe, and **E.Bulut**, *Wi-PT-Hand: Wireless Sensing based Low-cost Physical Rehabilitation Tracking for Hand Movements*, ACM Transactions on Computing for Healthcare, 2024, doi: 10.1145/3688855

[J30] J. Chung, I. Pretzer-Aboff, and **E.Bulut**, *Using a Device-Free WiFi Sensing System to Assess Daily Activities and Mobility in Low-Income Older Adults: Protocol for a Feasibility Study*, JMIR Research Protocols (JRP), 2024.

[J29] S. M. Hernandez(g), and **E.Bulut**, *WiFi Sensing on the Edge: Signal Processing Techniques and Challenges for Real-World Systems*, IEEE Communications Surveys & Tutorials, 2022, doi: 10.1109/COMST.2022.3209144

[J28] A. Chapnevis(g), I. Guvenc, and **E.Bulut**, *IMSI Sharing based Dynamic and Flexible Traffic*

Aggregation for Massive IoT Networks, IEEE Internet of Things Journal, 2022, doi: 10.1109/JIOT.2022.3155923

[J27] S. M. Hernandez^(g), and **E.Bulut**, *WiFederated: Scalable WiFi Sensing using Edge Based Federated Learning*, IEEE Internet of Things Journal, 2021, doi: 10.1109/JIOT.2021.3137793

[J26] F. Yucel^(g), and **E.Bulut**, *Online Stable Task Assignment in Opportunistic Mobile Crowdsensing with Uncertain Trajectories*, IEEE Internet of Things Journal, 2021, doi: 10.1109/JIOT.2021.3118134

[J25] F. Yucel^(g), M. Yuksel and **E.Bulut**, *Coverage-aware Stable Task Assignment in Opportunistic Mobile Crowdsensing*, IEEE Transactions on Vehicular Technology (TVT) , 2021, doi: 10.1109/TVT.2021.3065688

[J24] E. Erdin, M. Cebe, K. Akkaya, **E.Bulut**, and S. Uluagac, *A scalable private Bitcoin payment channel network with privacy guarantees*, Journal of Network and Computer Applications (JNCA), 2021, doi: 10.1016/j.jnca.2021.103021

[J23] F. Yucel^(g), M. Yuksel and **E. Bulut**, *QoS-based Budget Constrained Stable Task Assignment in Mobile Crowdsensing*, IEEE Transactions on Mobile Computing (TMC), 2020, doi: 10.1109/TMC.2020.2997280

[J22] A. Dhungana^(g), and **E.Bulut**, *Energy balancing in mobile opportunistic networks with wireless charging: Single and multi-hop approaches*, Elsevier Ad hoc Networks, 2020, doi: 10.1016/j.adhoc.2020.102342

[J21] S. Hernandez^(g), and **E. Bulut**, *Using Perceived Direction Information for Anchorless Relative Indoor Localization*, Journal of Network and Computer Applications (JNCA), 2020, doi: 10.1016/j.jnca.2020.102714

[J20] F. Yucel^(g), and **E. Bulut**, *User Satisfaction Aware Maximum Utility Task Assignment in Mobile Crowdsensing*, Computer Networks, 2020, doi: 10.1016/j.comnet.2020.107156

[J19] M. Moin Uddin Chowdhury, S.J. Maeng, **E. Bulut**, and I. Guvenc, *3D Trajectory Optimization in UAV-Assisted Cellular Networks Considering Antenna Radiation Pattern and Backhaul Constraint*, IEEE Transactions on Aerospace and Electronic Systems (TAES), 2020.

[J18] E. Erdin, M. Cebe, K. Akkaya, S. Solak, **E. Bulut**, and S. Uluagac, *A Bitcoin Payment Network with Reduced Transaction Fees and Confirmation Times*, Computer Networks, 2020, doi: 10.1016/j.comnet.2020.107098

[J17] A. Dhungana^(g), and **E. Bulut**, *Peer-to-peer energy sharing in mobile networks: Applications, challenges, and open problems*, Elsevier Ad hoc Networks, 2019, doi: 10.1016/j.adhoc.2019.102029

[J16] **E. Bulut**, M. Kisacikoglu and K. Akkaya, *Spatio-Temporal Non-intrusive Direct V2V Charge Sharing Coordination*, IEEE Transactions on Vehicular Technology (TVT), 2019, doi: 10.1109/TVT.2019.293195

[J15] A. Dhungana^(g), T. Arodz, and **E. Bulut**, *Exploiting Peer-to-Peer Wireless Energy Sharing for Mobile Charging Relief*, Elsevier Adhoc Networks, 2019.

[J14] F. Yucel^(g), K. Akkaya, and **E.Bulut**, *Efficient and Privacy Preserving Supplier Matching for Electric Vehicle Charging*, Elsevier Ad hoc Networks, pp. 1-10, 2018.

[J13] H. Binol, I. Guvenc*, **E.Bulut** and K. Akkaya, *A hybrid evolutionary search method for complex function optimization problems*, IET Electronics Letters, 2018.

[J12] F. Yucel^(g), and **E.Bulut**, *Clustered Crowd GPS for Privacy Valuing Active Localization*, IEEE Access, 6(1), pp. 23213-23221, 2018.

[J11] X. Lu, **E. Bulut***, and B. Szymanski, *Towards Limited Scale-free Topology with Dynamic Peer Participation*, Computer Networks, vol. 106, pp. 109-121, 2016.

- [J10] **E. Bulut***, S. Geyik, and B. Szymanski, *Efficient Routing in DTNs with Correlated Node Mobility*, in Elsevier Pervasive and Mobile Computing (PMC), pp 150-163, August, 2014.
- [J9] **E. Bulut*** and B. Szymanski, *WiFi Access Point Deployment for Efficient Mobile Data Offloading*, in ACM Mobile Computing and Communications Review (MC2R) 17(1):71-78, January, (**invited paper**), 2013.
- [J8] **E. Bulut***, B. Szymanski, *Constructing Limited Scale-Free Topologies Over Peer-to-Peer Networks*, IEEE Transactions on Parallel and Distributed Systems (TPDS), 25(4):919-928, 2014.
- [J7] S. Geyik, **E. Bulut**, and B. Szymanski, *Grammatical Inference for Modeling Mobility Patterns in Networks*, IEEE Transactions on Mobile Computing (TMC), 12(11), pp. 2119-2131, 2013.
- [J6] **E. Bulut***, and B. Szymanski, *Exploiting Friendship Relations for Efficient Routing in Mobile Social Networks*, IEEE Transactions on Parallel and Distributed Systems (TPDS), 23(12), pp. 2254-2265, 2012 (**spotlight (best) Paper** of the issue and featured by IEEE Special Technical Community on Social Networks).
- [J5] **E. Bulut***, and B. Szymanski, *Secure Multi-copy Routing in Compromised Delay Tolerant Networks*, in Springer Wireless Personal Communications, 73 (1), pp. 149-168, 2013 (**invited paper**).
- [J4] Z. Wang, **E. Bulut**, and B. Szymanski, *Energy Efficient Location Service for Mobile Ad Hoc Networks*, in Elsevier Ad hoc Networks, 11(1), pp. 273-28, January 2013.
- [J3] **E. Bulut***, and I. Korpeoglu, *Sleep Scheduling with Expected Common Coverage in Wireless Sensor Networks*, ACM Wireless Networks, vol. 17, issue 1, pp. 19-40, 2011.
- [J2] Z. Wang, **E. Bulut**, and B. Szymanski, *Distributed Energy Efficient Target Tracking with Binary Sensor Networks*, ACM Transactions on Sensor Networks, vol. 6, 2010.
- [J1] **E. Bulut***, Z. Wang, and B. Szymanski, *Cost Effective Multi-Period Spraying for Routing in Delay Tolerant Networks*, IEEE/ACM Transactions on Networking, vol. 18, 2010.

CONFERENCE/
WORKSHOP
PUBLICATIONS

- [C79] M. Touhiduzzaman^g, J. Chung, I. Pretzer-Aboff and **E. Bulut**, *Wireless Sensing-based Daily Activity Tracking System Deployment in Low-Income Senior Housing Environments*, in Proc. of IEEE the 30th Annual International Conference on Mobile Computing and Networking (MobiCom) - 1st ACM Workshop on Wireless and Mobile Computing for AgeTech (MobiCom4AgeTech), Nov. 18-22, 2024, Washington, D.C., USA.
- [C78] S. Ghosh^g, and **E. Bulut**, *Wi-Limb: Recognizing Moving Body Limbs Using a Single WiFi Link*, in Proc. of IEEE the 30th Annual International Conference on Mobile Computing and Networking (MobiCom) - 1st ACM Workshop on Wireless and Mobile Computing for AgeTech (MobiCom4AgeTech), Nov. 18-22, 2024, Washington, D.C., USA.
- [C77] A. Chapnevis^g and E. Bulut, *UAV Mesh Network Trajectory Planning for Age Optimal Data Collection in Infrastructureless Areas*, in Proc. of IEEE International Conference on Communications (ICC), Denver, CO, June, 2024.
- [C76] M. McDonough^u, T. Moomaw^u, M. Touhiduzzaman^g and **E. Bulut**, *Wi-Alert: WiFi Sensing for Real-time Package Theft Alerts at Residential Doorsteps*, in Proc. of the Twenty-fourth International Symposium on Theory, Algorithmic Foundations, and Protocol Design for Mobile Networks and Mobile Computing (MobiHoc '23) - The 8th National Workshop for REU Research in Networking and Systems (REUNS), October 23-26, 2023, Washington, DC, USA.
- [C75] J. Farley^u, A. Chapnevis^g, and **E. Bulut**, *Generalized Path Planning for Collaborative UAVs using Reinforcement and Imitation Learning*, in Proc. of the Twenty-fourth International Symposium on Theory, Algorithmic Foundations, and Protocol Design for Mobile Networks and

Mobile Computing (MobiHoc '23) - The 8th National Workshop for REU Research in Networking and Systems (REUNS), October 23-26, 2023, Washington, DC, USA.

[C74] B. D. Vilela[Ⓐ], K. Kokkera[Ⓐ], A. Chapnevis[Ⓔ], and **E. Bulut**, *UAV Control Using Eye Gestures: Exploring the Skies Through Your Eyes*, in Proc. of the Twenty-fourth International Symposium on Theory, Algorithmic Foundations, and Protocol Design for Mobile Networks and Mobile Computing (MobiHoc '23) - The 8th National Workshop for REU Research in Networking and Systems (REUNS), October 23-26, 2023, Washington, DC, USA.

[C73] A. Chapnevis[Ⓔ] and **E. Bulut**, *AoI-Optimal Cellular-Connected UAV Trajectory Planning for IoT Data Collection*, in Proc. of the 48th IEEE Conference on Local Computer Networks (LCN), Daytona Beach, Florida, October 2-5, 2023.

[C72] A. Bakr, M. Srewa, **E. Bulut**, K. Akkaya, M. Rahman, A. Alsharif, *Privacy-Preserving V2V Charge Sharing Coordination using the Hungarian Algorithm*, in Proc. of IEEE 97th Vehicular Technology Conference: VTC2023-Spring, Florence, Italy, 20-23 June 2023.

[C71] A. Chapnevis[Ⓔ] and **E. Bulut**, *Delay Optimal UAV Trajectory Planning for Secure Data Collection from Mobile IoT Networks*, in Proc. of the 24th IEEE International Conference on Industrial Technologies (ICIT), Orlando, FL, USA, April 4-6, 2023.

[C70] S. M. Hernandez, and E. Bulut, *Scheduled Spatial Sensing against Adversarial WiFi Sensing*, in Proc. of the 21st International Conference on Pervasive Computing and Communications (PerCom 2023) March 13-17, 2023, Atlanta, USA (acceptance ratio 17%).

[C69] S. Hernandez[Ⓔ], M. Touhiduzzaman[Ⓔ], P. Pidcoe, and **E. Bulut**, *Wi-PT: Wireless Sensing based Low-cost Physical Rehabilitation Tracking*, in Proc. of IEEE International Conference on E-health Networking, Application & Services (HealthCom), 2022.

[C68] A. Chapnevis[Ⓔ] and **E. Bulut**, *Share-Not-To-Waste: Scalable IoT Networking through Subscriber Identity Sharing*, in Proc. of the 19th IEEE International Conference on Mobile Ad-Hoc and Smart Systems (MASS 2022), October 20 - 22, Denver, Colorado, 2022.

[C67] S. M. Hernandez[Ⓔ] and **E. Bulut**, *Online Stream Sampling for Low-Memory On-Device Edge Training for WiFi Sensing*, in Proc. of 15th ACM Conference on Security and Privacy in Wireless and Mobile Networks - ACM Workshop on Wireless Security and Machine Learning (WiseML 2022), May 16-19, 2022.

[C66] F. Yucel[Ⓔ] and **E. Bulut**, *Three-dimensional Stable Task Assignment in Semi-opportunistic Mobile Crowdsensing*, in Proc. of the 23rd IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM), June 14-17, 2022.

[C65] S. M. Hernandez[Ⓔ], D. Erdag[Ⓐ] and **E. Bulut**, *Towards Dense and Scalable Soil Sensing Through Low-Cost WiFi Sensing Networks*, in Proc. of the 46th IEEE Conference on Local Computer Networks (LCN), October 4-7, 2021.

[C64] S. M. Hernandez[Ⓔ], and **E. Bulut**, *Adversarial Occupancy Monitoring using One-Sided Through-Wall WiFi Sensing*, in Proc. of IEEE International Conference on Communications (ICC) 2021, Virtual, Montreal.

[C63] A. Chapnevis[Ⓔ], I. Guvenc, L. Njilla and **E. Bulut**, *Collaborative Trajectory Optimization for Outage-aware Cellular-Enabled UAVs*, in Proc. of IEEE 93rd Vehicular Technology Conference: VTC2021-Spring, Virtual, 25 - 28 April 2021.

[C62] A. Chapnevis[Ⓔ], I. Guvenc, and **E. Bulut**, *Traffic Shifting based Resource Optimization in Aggregated IoT Communication*, in Proc. of IEEE Local Computer Networks (LCN), Nov 16-19, 2020.

- [C61] F. Yucel^g, and **E. Bulut**, *Time-dependent Stable Task Assignment in Participatory Mobile Crowdsensing*, accepted to appear in Proc. of IEEE Local Computer Networks (LCN), Nov 16-19, 2020.
- [C60] F. Yucel^g, A. Bhuyan, and **E. Bulut**, *Secure, Resilient and Stable Resource Allocation for D2D-based V2X Communication*, in Proc. of IEEE Resilience Week, Oct, 2020.
- [C59] **E. Bulut** and A. Dhungana^g, *Social-Aware Energy Balancing in Mobile Opportunistic Networks*, in Proc. of IEEE 16th International Conference on Distributed Computing in Sensor Systems (DCOSS) - 2nd International Workshop on Wirelessly Powered Systems and Networks (WPSN), July 15-17, 2020.
- [C58] A. Dhungana^g, and **E. Bulut**, *Opportunistic Wireless Crowd Charging of IoT Devices from Smartphones*, in Proc. of IEEE 16th International Conference on Distributed Computing in Sensor Systems (DCOSS) - 2nd International Workshop on Wirelessly Powered Systems and Networks (WPSN), July 15-17, 2020.
- [C57] S. Hernandez^g, and **E. Bulut**, *Lightweight and Standalone IoT based WiFi Sensing for Active Repositioning and Mobility*, in Proc. of 21st IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM), August 31 - September 03, 2020, Cork, Ireland.
- [C56] S. Hernandez^g, and **E. Bulut**, *Performing WiFi Sensing with Off-the-shelf Smartphones*, in Proc. of the IEEE International Conference on Pervasive Computing and Communications (Percom) as demo paper, 23-27 March 2020, Austin, TX, USA.
- [C55] F. Yucel^g, and **E. Bulut**, *Location-dependent Task Assignment for Opportunistic Mobile Crowdsensing*, in Proc. of the IEEE Consumer Communications & Networking Conference (CCNC), 10-13 January 2020, Las Vegas, USA.
- [C54] S. Hernandez^g, and **E. Bulut**, *TrinaryMC: Monte Carlo Based Anchorless Relative Positioning for Indoor Positioning*, in Proc. of the IEEE Consumer Communications & Networking Conference (CCNC), 10-13 January 2020, Las Vegas, USA.
- [C53] A. Dhungana^g, and **E. Bulut**, *Mobile Energy Balancing in Heterogeneous Opportunistic Networks*, in Proc. of the 16th IEEE International Conference on Mobile Ad-Hoc and Smart Systems (MASS), Monterey, CA, USA, November 4 - 7, 2019.
- [C52] A. Dhungana^g, and **E. Bulut**, *Loss-Aware Efficient Energy Balancing in Mobile Opportunistic Networks*, in Proc. of IEEE Global Telecommunications Conference (GLOBECOM), 9-13 December 2019, Waikoloa, HI, USA.
- [C51] F. Yucel^g, and **E. Bulut**, *Joint Optimization of System and User oriented Task Assignment in Mobile Crowdsensing*, in Proc. of IEEE Global Telecommunications Conference (GLOBECOM), 9-13 December 2019, Waikoloa, HI, USA.
- [C50] C. Wickramasinghe, D. Marino, F. Yucel^g, **E. Bulut**, and M. Manic, *Data Driven Hourly Taxi Drop-offs Prediction using TLC Trip Record Data*, in Proc. 12th International Conference on Human System Interaction (IEEE HSI) 2019, Richmond VA, USA, June, 25-27, 2019.
- [C49] E. Erdin, M. Cebe, K. Akkaya, **E. Bulut**, and S. Uluagac, *A Heuristic-based Private Bitcoin Payment Network Formation Using Off-Chain Links*, in Proc. of The International Conference on Blockchain (Blockchain-2019), Atlanta, July 14-17, 2019.
- [C48] A. Dhungana^g, and **E. Bulut**, *Energy sharing based Content Delivery in Mobile Social Networks*, in Proc. of 20th IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM), Washington D.C., June, 2019 (acceptance ratio 16%).

- [C47] **E. Bulut*** and M. Yuksel, *Integrating In-Network Computing for Secure and Efficient Cascaded Delivery in DTNs*, in Proc. of the 39th IEEE International Conference on Distributed Computing Systems (ICDCS 2019) Workshop on Network Meets Intelligent Computations (NMIC), July, 2019.
- [C46] S. Chaudhry, **E. Bulut**, and M. Yuksel, *A Distributed SDN Application for Cross-Institution Data Access*, in Proc. of the 28th International Conference on Computer Communications and Networks (ICCCN 2019), July, 2019 (invited).
- [C45] E. Ucer, R. Buckreus, M. C. Kisacikoglu*, **E. Bulut**, M. Guven, Y. Sozer, and L. Giubbolini, *A Flexible V2V Charger as a New Layer of Vehicle-Grid Integration Framework*, in Proc. of IEEE Transportation Electrification Conference (ITEC), 2019.
- [C44] **E. Bulut***, I. Guvenc and K. Akkaya *Privacy Preserving Distributed Matching for Device-to-Device IoT Communications*, in Proc. of The 12th ACM Conference on Security and Privacy (ACM WiSec), Miami, May, 2019 (Poster).
- [C43] M.U. Chowdhury, S. J. Maeng, I. Guvenc* and **E.Bulut**, *Effects of 3D antenna radiation and two-hop relaying on optimal UAV trajectory in cellular networks*, in Proc. IEEE Aerospace Conference, Big Sky, March, 2019.
- [C42] M.U. Chowdhury, **E.Bulut** and I. Guvenc, *Trajectory Optimization in UAV-Assisted Cellular Networks under Mission Duration Constraint*, to appear in Proc. IEEE Radio & Wireless Week (RWS), Orlando, Jan, 2019.
- [C41] F. Yucel^g, **E.Bulut*** and K. Akkaya, *Privacy Preserving Distributed Stable Matching of Electric Vehicles and Charge Suppliers*, in Proc. IEEE Vehicular Technology Conference (VTC-Fall), Chicago, August, 2018.
- [C40] **E.Bulut***, and I. Guvenc, *Dynamically Shared Wide-Area Cellular Communication for Hyperdense IoT Devices*, in Proc. Local Computer Networks (LCN) Workshops, Chicago, October, 2018.
- [C39] H. Binol, **E.Bulut**, K. Akkaya, and I. Guvenc, *Time Optimal Multi-UAV Path Planning for Gathering ITS Data from Roadside Units*, in Proc. IEEE Vehicular Technology Conference (VTC-Fall), Chicago, August, 2018.
- [C38] E. Erdin, M. Cebe, K. Akkaya, S. Solak, **E.Bulut**, and S. Uluagac, *Building a Private Bitcoin-based Payment Network among Electric Vehicles and Charging Stations*, in Proc. of The International Conference on Blockchain (Blockchain-2018), Halifax, Canada, July 30-Aug 3, 2018.
- [C37] **E.Bulut***, S. Hernandez^u, A. Dhungana^g and B. Szymanski, *Is Crowdcharging Possible?*, in Proc. of The 27th International Conference on Computer Communications and Networks (ICCCN 2018), 2018.
- [C36] **E.Bulut***, and I. Guvenc, *Trajectory Optimization for Cellular-Connected UAVs with Disconnectivity Constraint*, in Proc. of IEEE International Conference on Communications (ICC) Workshops (Integrating 5G into UAVs), Kansas City, May, 2018.
- [C35] A. Dhungana^g, T. Arodz, and **E.Bulut***, *Charging Skip Optimization with Peer-to-Peer Wireless Energy Sharing in Mobile Networks*, in Proc. of IEEE International Conference on Communications (ICC), Kansas City, May, 2018.
- [C34] B. Roberts, K. Akkaya, **E.Bulut**, and M. Kisacikoglu, *An Authentication Framework for Electric Vehicle-to-Electric Vehicle Charging Applications*, in Proc. MASS REU Research in Networking and Systems Workshop 2017, Orlando, October, 2017.
- [C33] **E. Bulut***, and A. Gossain, *Mobile Core Network Redimensioning for Efficient Resource*

Utilization, in Proc. Infocom Perfecto Workshop 2017, Atlanta, May, 2017.

[C32] A. Dhungana^g, and **E. Bulut**, *Timely Information Dissemination with Distributed Storage in Delay Tolerant Mobile Sensor Networks*, in Proc. Infocom MiseNet Workshop 2017, Atlanta, May, 2017.

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[C29] **E. Bulut***, and B. Szymanski, *Mobile Energy Sharing through Power Buddies*, in Proc. IEEE WCNC 2017, San Francisco, March, 2017.

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[C27] **E. Bulut***, and B. Szymanski, *Understanding User Behavior via Mobile Data Analysis*, in Proc. IEEE ICC Workshops, pp. 1548-1553., June 8, London, UK, 2015

[C26] **E. Bulut***, M. E. Ahsen, and B. Szymanski, *Opportunistic Wireless Charging for Mobile Social and Sensor Networks*, in Proc. of the 6th IEEE International Workshop on Management of Emerging Networks and Services (IEEE MENS 2014) in conjunction with IEEE GLOBECOM 2014, 8-12 December, Austin, 2014.

[C25] B. O. Holzbauer, B. Szymanski* and **E. Bulut**, *Impact of Socially Based Demand on the Efficiency of Caching Strategy*, in Proc. of 6th IEEE Int. Conf. Pervasive Computing and Communications Workshops (PERCOM Workshops), IEEE Press, pp. 401-406. , Budapest, Hungary, March 24-28, 2014.

[C24] **E. Bulut***, and B. Szymanski, *WiFi Access Point Deployment for Efficient Mobile Data Offloading*, in Proc. of ACM International Workshop on Practical Issues and Applications in Next Generation Wireless Networks (PINGEN 2012) at MOBICOM 2012, Istanbul, Turkey, August 26, 2012, pp. 45-50.

[C23] B. O. Holzbauer, B. Szymanski* and **E. Bulut**, *Socially-Aware Market Mechanism for Participatory Sensing*, in Proc. of ACM International Workshop on Mission-Oriented Wireless Sensor Networking (MiSeNet) at MOBICOM 2012, Istanbul, Turkey, August 26, 2012, pp. 9-14.

[C22] S. C. Geyik, **E. Bulut**, and B. Szymanski, *Utilizing PCFGs for Modeling and Learning Service Compositions in Sensor Networks*, in Proc. of IEEE International Conference on Service Computing, Hawaii, June, 2012.

[C21] **E. Bulut** and B. Szymanski, *On Growth of Limited Scale-Free Overlay Network Topologies*, in Proc. of Fourth International Workshop on Network Science for Communication Networks (NetSci-Com 2012), in conjunction with INFOCOM 2012, Orlando, March, 2012.

[C20] **E. Bulut** and B. Szymanski, *On Secure Multi-copy based Routing in Delay Tolerant Networks*, in Proc. of the First International Workshop on Privacy, Security and Trust in Mobile and Wireless Systems (MobiPST 2011), in conjunction with ICCN, 2011.

[C19] **E. Bulut**, S. Geyik and B. Szymanski, *Efficient Routing in Delay Tolerant Networks with Correlated Node Mobility*, in Proc. of 7th IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS), Nov, 2010.

- [C18] **E. Bulut**, and B. Szymanski, *Friendship based Routing in Delay Tolerant Mobile Social Networks*, in Proc. of GLOBECOM 2010.
- [C17] S. C. Geyik, **E. Bulut**, and B. Szymanski, *PCFG based Synthetic Mobility Trace Generation*, in Proc. of GLOBECOM 2010.
- [C16] Z. Wang, **E. Bulut**, and B. Szymanski, *Service Discovery for Delay Tolerant Networks*, in Proc. of workshop on Heterogeneous, Multi-Hop, Wireless and Mobile Networks (HeterWMN), in conjunction with GLOBECOM 2010.
- [C15] **E. Bulut**, S. Geyik, and B. Szymanski, *Conditional Shortest Path Routing in Delay Tolerant Networks*, in Proc. of 11th IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM) , June, 2010.
- [C14] Z. Wang, **E. Bulut**, and B. Szymanski *An Energy Efficient Location Service for Mobile Ad Hoc Networks*, in Proc. of ISCIS 2010.
- [C13] **E. Bulut**, Z. Wang, B. Szymanski *Cost Efficient Erasure Coding based Routing in Delay Tolerant Networks*, in Proc. of ICC 2010, South Africa.
- [C12] **E. Bulut**, Z. Wang, and B. Szymanski *The Effect of Neighbor Graph Connectivity on Coverage Redundancy in Wireless Sensor Networks*, in Proc. of ICC 2010.
- [C11] **E. Bulut**, Z. Wang, and B. Szymanski, *Impact of Social Networks on Delay Tolerant Routing*, in Proc. of GLOBECOM, pp.1-6, Nov. 30-Dec. 4, Honolulu, HI, 2009.
- [C10] Z. Wang, **E. Bulut**, and B. Szymanski, *Distributed Target Tracking with Directional Binary Sensor Networks*, in Proc. of GLOBECOM, pp.1-6, Nov. 30-Dec. 4, Honolulu, HI, 2009.
- [C9] Z. Wang, **E. Bulut**, and B. Szymanski, *Energy Efficient Collision Aware Multipath Routing for Wireless Sensor Networks*, in Proc. of IEEE International Conference on Communications (ICC), pp. 1-5, 14-18 June, Dresden, 2009.
- [C8] **E. Bulut**, J. Zheng[Ⓐ] , Z. Wang, and B. Szymanski, *Balancing the Cost-Quality Tradeoff in Cooperative Ad hoc and Sensor Networks*, in Proc. of IEEE MILCOM, San Diego Convention Center, CA, November 2008.
- [C7] **E. Bulut**, Z. Wang, and B. Szymanski, *Minimizing Average Spraying Cost for Routing in Delay Tolerant Networks*, Second Annual Conference of International Technology Alliance (ITA), ACITA, Imperial College London, September 2008.
- [C6] **E. Bulut**, Z. Wang, and B. Szymanski, *Time Dependent Message Spraying for Routing in Intermittently Connected Networks*, in Proc. of GLOBECOM, pp. 1-6, New Orleans, Nov 30-Dec 4, 2008.
- [C5] Z. Wang, **E. Bulut**, and B. Szymanski, *Distributed Target Tracking with Imperfect Binary Sensor Networks*, in Proc. of GLOBECOM, pp. 1-6, New Orleans, Nov 30-Dec 4, 2008.
- [C4] **E. Bulut**, Z. Wang, and B. Szymanski, *Cost-Quality Tradeoff in Cooperative Sensor Networking*, ICC2008 COCONET Workshop, 2008.
- [C3] Z. Wang, **E. Bulut**, and B. Szymanski, *A Distributed Cooperative Target Tracking with Binary Sensor Networks*, ICC2008 CoopNet Workshop, 2008.
- [C2] **E. Bulut**, and I. Korpeoglu, *DSSP: A Dynamic Sleep Scheduling Protocol for Prolonging the Lifetime of Wireless Sensor Networks*, Third IEEE International Workshop on Heterogeneous Wireless Networks, in conjunction with AINA, 2007.

[C1] **E. Bulut**, and T. Capin, *Key Frame Extraction from Motion Capture Data by Curve Saliency*, CASA 2007 - Computer Animation and Social Agents, 2007.

BOOK CHAPTERS

[B4] F. Yucel^g, M. Yuksel, and **E. Bulut** "Stable Worker-Task Assignment in Mobile Crowdsensing Applications", *Advances in Mobile Crowdsourcing: From Theory to Practice*. (En Wang, Jie Wu Ed.), Springer International Publishing, 143-162, 2023.

[B3] **E. Bulut**, *Delay Tolerant Mobile Sensor Networks: Opportunities and Challenges*, The Philosophy of Mission-Oriented Wireless Sensor Networks (H. Ammari Ed.) Springer Publisher, 2018.

[B2] B. O. Holzbauer, **E. Bulut**, B. Szymanski, *Incentivizing Participatory Sensing via Auction Mechanisms*, Chapter in *Opportunistic Mobile Social Networks*, Jie Wu and Yunsheng Wang, Eds, Taylor and Francis, CRC Press, 2014, to pp. 339-376.

[B1] **E. Bulut**, B. Szymanski, *Bio-inspired Multi-Period Routing Algorithms in Delay Tolerant Networks*, in *Springer Lecture Notes in Computer Science (LNCS)*, vol. 6745, 2011.

HONORS AND AWARDS

Best-demo award in Percom (core A* conference), 2020.
Air Force Research Lab (AFRL), Summer Faculty Fellowship, 2019.
VCU Computer Science Departmental Teaching and Publication Awards, 2017-2020.
Ranked with exceptional performance (top 5% of employees), Cisco Systems, 2014.
Promotion to Upper Level, Cisco Systems, 2013.
Spotlight (Best) Paper of TPDS Dec 2012 Issue.
IEEE Student Travel Grant, MASS 2010.
Full scholarship (tuition and stipend) during B.S., M.S. and Ph.D., 2001-2011.
Gold and Bronze medals in Nationwide Math Olympics, 1998-2000.

STUDENT SUPERVISION

Aashish Dhungana: (graduated in Dec 2020).
Dissertation title: Leveraging Peer-to-Peer Energy Sharing for Resource Optimization in Mobile Social Networks
First position after graduation: Comprehensive Healthcare Systems

Fatih Yucel: (graduated in Dec 2021).
Dissertation title: Preference-Aware Task Assignment in Mobile Crowdsensing
First position after graduation: Bloomberg LP

Steven M. Hernandez: (GRFP fellow - graduated in May 2023).
Dissertation title: WiFi Sensing at the Edge to Improve the Scalability of Wireless Sensing Systems
First position after graduation: Google Research

Amirahmad Chapnevis: (graduated in May 2024).
Dissertation title: Efficient Connectivity Management and Path Planning for IoT and UAV Networks
First position after graduation: Dilliard's Inc.

Md Touhiduzzaman: (doing Ph.D. since Fall 2021).
Topic: Health applications with WiFi Sensing

Soumita Ghosh: (started Ph.D. in Fall 2022).
Topic: TBD

Nafeez Fahad: (started Ph.D. in Spring 2024).
Topic: TBD

Member of Advisory Committee

Luiz Felipe Franchetti Dias, Ph.D. Advisor: Rodrigo Spinola (CS)
Mohammed Ayyat, Ph.D. Advisor: Tamer Nadeem (CS)
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Hannaneh Barahouei Pasandi, Ph.D. Advisor: Tamer Nadeem (CS)
Chathurika Brahmana, Ph.D. Advisor: Milos Manic (CS)

Bahman Rashidi, Ph.D. Advisor: Carol Fung (CS)
 Manziva Akanda Nishi, Ph.D., Advisor: Kostadin Damevski (CS)
 Javad Abed, Ph.D., Advisor: Manoj Thomas (Information Systems)
 Pulkit Rustgi, M.S., Advisor: Carol Fung (CS)

CONFERENCE AND
 WORKSHOP
 ORGANIZATION

Organizing Committee

IEEE Conference on Local Computer Networks, 2024 (General Chair), 2023 (TPC Chair), 2022 (TPC co-chair), 2021 (Publications chair), 2020 (Symposium/Edas chair), 2019 (Student Grants/Edas chair), 2018 (Publicity chair).
 IEEE WiSense (Percom) Workshop, 2024 (Chair).
 IEEE MASS 2023 (TPC co-chair), 2024 (Travel grants co-chair).
 IEEE NOMS 2023 (Doctoral Symposium co-chair).
 IEEE LANMAN 2020 (Publications chair).
 IEEE Resilience Week 2022, 2021, 2020 (Communications track chair).
 IEEE WPSN 2020 (general chair), DCOSS workshop on Wirelessly Powered Systems and Networks.

Technical Program Committee (TPC)

IEEE WoWMoM (2018-2024) - World of Wireless, Mobile and Multimedia Networks.
 IEEE ICC (2018-2024) - International Conference on Communications.
 IEEE IPCCC (2022) - International Performance Computing and Communications Conference.
 IEEE Globecom (2019-2024) - Global Communications Conference.
 IEEE ICDCN (2023) - International Conference On Distributed Computing And Networking.
 IEEE PIMRC (2018-2023) - International Symposium on Personal, Indoor and Mobile Radio Communications.
 IEEE VTC 2023-Fall, 2019-Fall, 2018-Fall, 2018-Spring, 2017-Fall - Vehicular Technology Conference.
 MobiSPC, The 14th International Conference on Mobile Systems and Pervasive Computing.
 IEEE Socialcom- The 9th International Conference on Social Computing and Networking.
 IEEE DCOSS 2013 - Social Networks & Crowdsensing Track.
 PerNem 2013 - The Third International Workshop on Pervasive Networks for Emergency Management, in conjunction with PerCom.
 IQ2S 2013 - The 5th International Workshop on Information Quality and Quality of Service for Pervasive Computing, in conjunction with PerCom.
 MobiPST 2015, 2013, 2012 - The International Workshop on Privacy, Security and Trust in Mobile and Wireless Systems, in conjunction with ICCN.
 MobiWIS 2011 - The 8th International Conference on Mobile Web Information Systems - Mobile Web and Social Networks track.

INVITED TALKS

Wireless Smart Home Intrusion Detector, Commonwealth Cyber Initiative Spring Speaker Series, Feb, 2024.
5G V2X Communications and Security, Idaho National Labs (INL), Wireless Security Workshop, Nov 2022.
Rapid and Resilient Critical Data Sourcing for Public Safety and Emergency Response, US-Ignite Research Summit, Austin, TX, June 2017.
Limited Scale-Free Topologies Over Peer-to-Peer Networks, Department of Computer Science Seminar Series, Virginia Commonwealth University, October 2016.
Introduction to iOS Programming and Swift, RamDev Talk Series, November, 2016.
Mobile Social Networks: Challenges and Opportunities, Department of Computer and Electrical Engineering, Virginia Commonwealth University, Dec 2015.
Mobile Social Networks: Challenges and Opportunities, Department of Computer Science & Engineering, University of Nevada, Reno, March 2014.

Routing in DTNs, Department of Computer Science and Information Systems, Texas A&M University-Commerce, May 2011.

Opportunistic Routing Algorithms in Delay Tolerant Networks, CReWMaN Lab, Computer Science and Engineering Department, University of Texas - Arlington, Dec 2010.

Opportunistic Routing Algorithms in Delay Tolerant Networks, Altschuler Lab, UTSouthwestern Medical Center, May 2010.

CONFERENCE &
WORKSHOP
PRESENTATIONS

Loss-Aware Efficient Energy Balancing in Mobile Opportunistic Networks, GLOBECOM, 2019.

Joint Optimization of System and User oriented Task Assignment in Mobile Crowdsensing, GLOBECOM, 2019.

Dynamically Shared Wide-Area Cellular Communication for Hyper-dense IoT Devices, Local Computer Networks (LCN) Workshops, 2018.

Mobile Core Network Redimensioning for Efficient Resource Utilization, INFOCOM Perfecto Workshop, 2017.

Timely Information Dissemination with Distributed Storage in Delay Tolerant Mobile Sensor Networks, INFOCOM Misenet Workshop, 2017.

Identifying the Space Buddies to Track Lost Items, SocialSens Workshop (CPSWeek), 2017.

Mobile Energy Sharing through Power Buddies, Wireless Communications and Networking Conference (WCNC), 2017.

Rethinking Offloading WiFi Access Point Deployment from User Perspective, Wireless and Mobile Computing, Networking and Communications (WiMob) SeuNet Workshop, 2016.

Opportunistic Wireless Charging for Mobile Social and Sensor Network, GLOBECOM MENS Workshop, 2014.

Efficient Routing in Delay Tolerant Networks with Correlated Node Mobility, International Conference on Mobile Ad-hoc and Sensor Systems (MASS), 2010. (Travel grant)

Time Dependent Message Spraying for Routing in Intermittently Connected Networks, GLOBECOM, 2008.

Distributed Target Tracking with Imperfect Binary Sensor Networks, GLOBECOM, 2008.

ACADEMIC
SERVICE

Associate Editor: Elsevier Adhoc Networks, IEEE Access

Guest Editor: Elsevier Pervasive and Mobile Computing (PMC) Journal - Special Issue on Pervasive Mobile Sharing

Panel review: NSF (2024 (3), 2023 (1), 2021(2), 2020(1), 2018(2), 2017(2)), Singapore Land Transport Authority (LTA) (2018)

Department committee: Department Chair Search Committee (2024), Faculty Search and Recruitment (2021), High School Programming Contest, RamHacks.

Journal Reviewer: IEE/ACM Transactions on Networking, IEEE Transactions on Mobile Computing, ACM Transactions on Sensor Networks, IEEE Transactions on Parallel and Distributed Systems, IEEE Transactions on Signal Processing, IEEE Transactions on Vehicular Technology, IEEE Transactions on Industrial Informatics, IEEE Transactions on Wireless Communications,

IEEE Transactions on Communications, IEEE Journal on Selected Areas in Communications, Computer Journal, Computer and Informatics Journal, IEEE Communications Magazine, IEEE Access, ACM Transactions on Sensor Networks, ACM Computing Surveys, Elsevier Computer Networks, Elsevier Adhoc Networks, Elsevier Computer Communications, Springer Wireless networks.

Conference Reviewer: Wowmom 2024-2018, Infocom 2022-2023, 2017, LCN 2024-2016, Globecom 2024-2017, ICC 2024-2010, VTC 2024-2016, PIMRC 2024-2018, Socialcom 2016, PerNem 2013, WCNC 2013, ACITA 08/09/10/11, FutureNetworks 2010.