Cristian Borcea - Curriculum Vitae

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Education

Ph.D.	Computer Science, Rutgers University, New Jersey	2004
M.S.	Computer Science, Rutgers University, New Jersey	2002
M.S.	Computer Science, University Politehnica, Bucharest, Romania	1997
B.S.	Computer Science, University Politehnica, Bucharest, Romania	1996

Academic Appointments

- **Professor**　Department of Computer Science, New Jersey Institute of Technology (2016 -)

- **Visiting Professor**　National Institute of Informatics, Tokyo, Japan (2012 -)

- **Visiting Associate Professor** Paris Dauphine University, France, 2015

- **Visiting Associate Professor** University of Bologna, Italy, 2012

- **Visiting Associate Professor** University of Versailles, France, 2011

- **Associate Professor**　Department of Computer Science, New Jersey Institute of Technology (2009 - 2016)

- **Assistant Professor**　Department of Computer Science, New Jersey Institute of Technology (2004 - 2009)

Academic Leadership Appointments & Main Accomplishments

- **Associate Dean for Strategic Initiatives**　Ying Wu College of Computing (YWCC), New Jersey Institute of Technology (2020 - 2024)

  - Leadership role in developing, refining, and implementing YWCC Strategic Plan 2020-2025
  - Led YWCC student recruiting efforts - enrollment growth of 45% since 2020
  - Led the creation of Department of Data Science
  - Part of leadership team that created BS Data Science Program - joint program with Math Department (with D. Bader and C. Wu)
  - Leadership role in developing annual YWCC Faculty Recruiting Plans
  - Leadership role in NJIT's designation as a National Center of Academic Excellence in Cybersecurity by the NSA/DHS

- Led High School Outreach Program - bi-directional visits to/from high schools
- Created NJ STEM Teacher Program - offer scholarships to teachers enrolled in graduate certificates
- Led the creation of NJIT partnership with University of Bologna, Italy
- Led the creation of NJIT partnership with Fulbright University, Vietnam (with H. Phan)

- **Chair** Department of Computer Science, New Jersey Institute of Technology (2015 - 2018)

  - Planned and managed hiring of faculty, lecturers, and adjunct professors
  - Managed annual evaluation of faculty/lecturers/staff and promotion and tenure process
  - Mentored new faculty - most have been already tenured and/or promoted
  - Worked with the Dean to plan and manage major renovation of physical space of CS department
  - Leadership role in creating MS Data Science - joint program with Math Department (with U. Roshan)
  - Leadership role in creating Research Centers on Big Data (with C. Wu and Y. Chen) and Cybersecurity (with K. Rohloff and R. Curtmola)
  - Ledership role in the creation of NJIT partnership with National Institute of Informatics, Tokyo, Japan (with V. Oria)

- **Associate Chair** Department of Computer Science, New Jersey Institute of Technology (2012 - 2015)

  - Created first fully-online program in YWCC, MS CS Online, and managed the relation with Pearson/Embanet for marketing/recruiting/retention
  - Managed department course scheduling
  - Chair of CS Undergraduate Education Committee and Department Representative on NJIT Committee on Undergraduate Education

Current Research Interests

Distributed Machine Learning; Mobile Computing and Sensing; Online Privacy; Computational Advertising.

Research Highlights

- **Machine Learning for Mobility**

  Built federated learning systems for mobile sensing data on Android devices, which were tested on human activity recognition and heart rate prediction in the wild. Designed and implemented novel optimizations and applications for federated learning. Created a prediction model for cellular traffic that incorporates fine-grained handover information to increase

prediction accuracy. Built a system for location prediction of mobile users, based on GPS traces collected on smart phones, which achieves high prediction accuracy at a fine-grained temporal scale, while protecting user location privacy.

- **Computational Advertising**

  Designed and implemented deep learning techniques to optimize the publisher's revenue in real-time online Ad auctions. Developed a parametric survival model for reserve price failure rate prediction in display advertising. Created online deep learning models for spatial and temporal viewability prediction of ads in web pages that consider both user and web page information. Analyzed ad blocker usage on the web and designed counter ad blcoking strategies based on the probability that a given user will whitelist a given web page.

- **Mobile Cloud Computing**

  Designed and implemented a system architecture, a middleware, and a high-level programming model for mobile distributed computing assisted by the cloud. Built an application-specific overlay file system that allows concurrent tasks executing on mobiles and the cloud to share efficiently and consistently. Created a sensor virtualization system to seamlessly access sensors on different physical devices from any mobile device or from tasks offloaded in the cloud. Demonstrated a secure and efficient method to perform privacy-aware face matching in the cloud.

- **Vehicular Computing and Networking**

  Built service prototypes for scalable traffic monitoring and cab booking. Designed road-based routing and forwarding protocols for efficient data delivery in vehicular networks. Created two analytical models for predicting path durations in vehicular ad hoc networks and shown their benefits for routing protocols. Demonstrated how proactive load balancing of vehicular traffic alleviates congestions and improves travel times. Created a parking assignment system for efficient allocation of free parking sport in the cities.

- **Mobile Crowdsensing**

  Designed and evaluated a mobile crowd sensing platform for Android phones. Created data reliability mechanisms for mobile crowd sensing. Built a mobile game that was used to show that gamification techniques could work well as an incentive for uniform sensing area coverage. Ran a user study that showed mobile gaming can be a successful alternative to micro-payments in several crowdsensing scenarios. Demonstrated how mobile crowdsourcing can leverage the power of collective intelligence in smart cities.

- **Mobile Social Computing**

  Designed and built MobiSoC, the first middleware for mobile social computing. Demonstrated community inference algorithms using location and co-location data collected from 100+ users carrying smart phones. Proposed Mobius, a socially-aware network infrastructure for mobile social computing. Created Prometheus, a service in Mobius, to provide user-controlled peer-to-peer social data management. Designed a technique for balanced content replication in peer-to-peer online social networks.

- **Programming Mobile Ad Hoc Networks**

  Done pioneering work on context-aware distributed programming models for mobile ad hoc networks and proposed Urbanets, people-centric, spontaneously-created mobile sensor networks in urban environments. Designed and implemented Spatial Programming, a location-aware programming model, on top of Smart Messages, a computing platform based on execution migration. Built Migratory Services, a service model under which service migrations are triggered by context changes while the client-service interaction continues uninterrupted.

- **Dependable Mobile Distributed Computing and Networks**

  Designed and implemented policy enforcing mechanisms for creating and maintaining trusted ad hoc networks. These mechanisms are based on a kernel-level trusted execution monitor built on top of the Trusted Platform Module. Proposed and built on smart phones a context-aware service fault-tolerance mechanism for ad hoc networks. Demonstrated a location authentication protocol for mobile users that works without infrastructure support. Designed and built an automatic approach for on-the-fly wireless access network establishment.

Publications

- **Books**

  [1] C. Borcea, M. Talasila, and R. Curtmola. "Mobile Crowdsensing". Chapman and Hall/CRC, ISBN-10: 1498738443, 2016.

- **Refereed Journal Articles**

  [2] X. Jiang, H. Hu, T. On, P. Lai, V. Mayyuri, A. Chen, D. Shila, A. Larmuseau, R. Jing, C. Borcea, N. Phan, "FLSys: Toward an Open Ecosystem for Federated Learning Mobile Apps," IEEE Transactions on Mobile Computing, Vol. 23, No. 1, 2024.

  [3] S. Zhao, M. Chen, C. Borcea, Y. Chen, "Personalized Dynamic Counter Ad-Blocking Using Deep Learning," IEEE Transactions on Knowledge and Data Engineering, Vol. 35, No. 8, 2023.

  [4] A. Hakeem, R. Curtmola, X. Ding, and C. Borcea, "DFPS: A Distributed Mobile System for Free Parking Assignment," IEEE Transactions on Mobile Computing, Vol. 21, No. 12, 2022.

  [5] X. Shang, W. Jia, J. Shan, X. Ding, C. Borcea, "Reestablishing Page Placement Mechanisms for Nested Virtualization," IEEE Transactions on Cloud Computing, Vol. 11, No. 3, 2023.

  [6] I. Sandu Popa, D. H. Ton That, K. Zeitouni, C. Borcea, "Mobile Participatory Sensing with Strong Privacy Guarantees Using Secure Probes," Springer GeoInformatica, Vol. 25, 2021.

  [7] Chang Guo, Demin Li, Guanglin Zhang, Xiaoning Ding, Reza Curtmola, and Cristian Borcea, "Dynamic Interior Point Method for Vehicular Traffic Optimization," IEEE Transactions on Vehicular Technology, Vol. 69, No. 5, May 2020.

[8] N. Paiker, J. Shan, C. Borcea, N. Gehani, R. Curtmola, X. Ding. "Design and Implementation of an Overlay File System for Cloud-Assisted Mobile Apps". IEEE Transactions on Cloud Computing, Vol. 8, No. 1, March 2020.

[9] H. Debnath, M. Khan, N. Paiker, X. Ding, N. Gehani, R. Curtmola and C. Borcea. "The Moitree Middleware for Distributed Mobile-Cloud Computing". Elsevier Journal of Systems and Software, Volume 157, November 2019.

[10] C. Wang, S. Zhao, A. Kalra, C. Borcea, and Y. Chen. "Webpage Depth Viewability Prediction using Deep Sequential Neural Networks". IEEE Transactions on Knowledge and Data Engineering, Vol.31, No. 3, March 2019.

[11] C. Wang, S. Zhao, A. Kalra, C. Borcea, Y. Chen. "Predictive Models and Analysis for Webpage Depth-level Dwell Time". Journal of the Association for Information Science and Technology, Vol. 69, No. 8, 2018.

[12] C. Wang, A. Kalra, L. Zhou, C. Borcea, and Yi. Chen. "Probabilistic Models for Ad Viewability Prediction on the Web". IEEE Transactions on Knowledge and Data Engineering, Vol. 29, No. 9, 2017.

[13] M. A. Khan, L. Yeh, K. Zeitouni, and C. Borcea. "MobiStore: A System for Efficient Mobile P2P Data Sharing". Springer Peer-to-Peer Networking and Applications, Volume 10, Number 4, 2017.

[14] C. Borcea, A. D. Gupta, Y. Polyakov, K. Rohloff, and G. Ryan. "PICADOR: End-to-End Encrypted Publish-Subscribe Information Distribution with Proxy Re-Encryption". Elsevier Future Generation Computer Systems, Special Issue on Reliable Software Technologies and Communication Middleware, Volume 71, 2017.

[15] J. Pan, I Sandu Popa, and C. Borcea, "DIVERT: A Distributed Vehicular Traffic Rerouting System for Congestion Avoidance". IEEE Transactions on Mobile Computing, Vol. 16, No. 1, 2017.

[16] M. Talasila, R. Curtmola, and C. Borcea, "Crowdsensing in the Wild with Aliens and Micro-payments". IEEE Pervasive Computing Magazine, Vol. 15, No. 1, 2016.

[17] Q. T. Minh, Y. Shibata, C. Borcea, and S. Yamada. "On-site Configuration of Disaster Recovery Access Networks Made Easy". Elsevier Ad Hoc Networks, Vol. 40, 2016.

[18] R. Liu, H. Liu, D. Kwak, Y. Xiang, C. Borcea, B. Nath, and L. Iftode, "Balanced Traffic Routing: Design, Implementation and Evaluation". Elsevier Ad Hoc Networks, Special Issue on Advances in Vehicular Networks. Vol. 37, 2016.

[19] F. Yasmeen, U. T. Nguyen, N. Huda, C. Borcea, and S. Yamada. "A Message Transfer Framework for Enhanced Reliability in Delay-Tolerant Networks". Network Protocols and Algorithms, Vol. 7, No. 3, 2015.

[20] N. Kourtellis, J. Blackburn, C. Borcea, and A. Iamnitchi. "Enabling Social Applications via Decentralized Social Data Management". ACM Transactions on Internet Technology, Special Issue on Foundation of Social Computing, Vol. 15, No. 1, 2015. Article 1.

[21] M. Talasila, R. Curtmola, and C. Borcea. "Collaborative Bluetooth-based location authentication on smart phones". Elevier Pervasive and Mobile Computing Journal, Vol. 17, February 2015.

[22] Q. T. Minh, K. Nguyen, C. Borcea, S. Yamada. "On-the-Fly Establishment of Multihop Wireless Access Networks for Disaster Recovery". IEEE Communications Magazine, Special Issue on Disaster Resilience in Communication Networks, Vol. 52, No. 10, 2014.

[23] D. Boston, S. Mardenfeld, J. Pan, Q. Jones, A. Iamnitchi, and C. Borcea. "Leveraging Bluetooth Co-location Traces in Group Discovery Algorithms". Elsevier Pervasive and Mobile Computing Journal, Vol. 11, Special Section on Mobile Social Networks, 2014.

[24] J. Pan, I. Sandu Popa, K. Zeitouni, and C. Borcea. "Proactive Vehicular Traffic Rerouting for Lower Travel Time". IEEE Transactions on Vehicular Technology, Vol. 62, No. 8, 2013.

[25] M. Talasila, R. Curtmola, and C. Borcea. "ILR: Improving Location Reliability in Mobile Crowd Sensing". International Journal of Business Data Communications and Networking, Vol. 9, No. 4, 2013.

[26] A. Aziz, Md. Haque, C. Borcea, Y, Hassan, and S. Yamada. "Managing Disconnected Mobile Nodes in a Delay Tolerant Network with HALF Routing Protocol". IEICE Transactions on Communications, Special Section on Internet Architectures, Protocols, and Management Methods that Enable Sustainable Development; Vol. E96-B, No. 7, 2013.

[27] G. Cardone, L. Foschini, C. Borcea, P. Bellavista, A. Corradi, M. Talasila, and R. Curtmola, "Fostering ParticipAction in Smart Cities: A Geo-Social CrowdSensing Platform". IEEE Communications Magazine, Special Issue on Smart Cities, Vol. 51, No. 6, 2013.

[28] H. Kurose, C. Borcea, and S. Yamada, "TCR: Tag Caching Router Architecture with Folksonomies for CGM Contents". IEICE Transactions on Communications, Japanese Edition, Vol. J96-B, No.2, 2013.

[29] G. Xu, C. Borcea, and L. Iftode, "A Policy Enforcing Mechanism for Trusted Ad Hoc Networks". IEEE Transactions on Dependable and Secure Systems. Vol. 8, No. 3, 2011.

[30] J. Nzouonta, M. Nakayama, and C. Borcea, "On Deriving and Incorporating Multihop Path Duration Estimates in VANET Protocols". ACM Transactions on Modeling and Computer Simulation. Vol. 21, No. 2, 2011, Article 14.

[31] J. Nzouonta, T. Ott, and C. Borcea, "Impact of Queuing Discipline on Packet Delivery Latency in Ad Hoc Networks". Elsevier Performance Evaluation Journal, Special Issue on Performance Evaluation of Wireless Ad Hoc, Sensor, and Ubiquitous Networks. Vol. 66, No. 12, 2009.

[32] J. Nzouonta, N. Rajgure, G. Wang, and C. Borcea, "VANET Routing on City Roads using Real-Time Vehicular Traffic Information". IEEE Transactions on Vehicular Technology. Vol. 58, No. 7, 2009.

[33] A. Gupta, A. Kalra, D. Boston, and C. Borcea, "MobiSoC: A Middleware for Mobile Social Computing Applications". ACM/Springer MONET, Vol. 14, No. 1, January 2009.

[34] O. Riva, T. Nadeem, C. Borcea, and L. Iftode, "Context-Aware Migratory Services in Ad Hoc Networks". IEEE Transactions on Mobile Computing, Vol. 6, No. 12, December, 2007.

[35] A. Gupta, S. Paul, Q. Jones, and C. Borcea, "Automatic Identification of Informal Social Groups and Places for Geo-Social Recommendations". International Journal of Mobile Network Design and Innovation (IJMNDI) Vol. 2, No. 3/4, December, 2007.

[36] O. Riva and C. Borcea, "The Urbanet Revolution: Sensor Power to the People!". IEEE Pervasive Computing, Special Issue on Building a Sensor-Rich World, Vol. 6, No. 2, Apr-Jun 2007.

[37] P. Kang, C. Borcea, G. Xu, A. Saxena, U. Kremer, and L. Iftode, "Smart Messages: A Distributed Computing Platform for Networks of Embedded System". The Computer Journal, Special Focus - Mobile and Pervasive Computing, British Computing Society, Oxford University Press, Vol. 47, No. 4, 2004.

- **Refereed Conference Papers**

[38] P. Sen and C. Borcea, "FedMTL: Privacy-Preserving Federated Multi-Task Learning," The 27th European Conference on Artificial Intelligence (ECAI), October 2024.

[39] T. K. Ton, N. Nguyen, M. Nazzal, A. Khreishah, C. Borcea, H. Phan, R. Jin, I. Khalil, Y. Shen, "SGCode: A Flexible Prompt-Optimizing System for Secure Generation of Code," Demo Abstract. The 31st ACM Conference on Computer and Communications Security (CCS), October 2024.

[40] M. Smith, A. Torres, R. Grossman, P. Sen, Y. Chen, C. Borcea, "A Study of GDPR Compliance under the Transparency and Consent Framework," The 2024 ACM Web Conference (WWW), May 2024.

[41] A. Kalra, C. Wang, C. Borcea, Y. Chen, "Reserve Price Optimization in First-Price Auctions via Multi-Task Learning," 23rd IEEE International Conference on Data Mining (ICDM 2023), December 2023.

[42] P. Sen, X. Jiang, Q. Wu, M. Talasila, W.-L. Hsu, C. Borcea, "GoPlaces: An App for Personalized Indoor Place Prediction," The 20th IEEE International Conference on Mobile Ad-Hoc and Smart Systems (MASS 2023), September 2023.

[43] X. Jiang, T. Oh, N. Phan, H. Mohammadi, V. Mayyuri, A. Chen, R. Jin, C. Borcea, "Zone-based Federated Learning for Mobile Sensing Data," The 21st IEEE International Conference on Pervasive Computing and Communications (PerCom 2023), March 2023.

[44] X. Jiang, C. Borcea, "Complement Sparsification: Low-Overhead Model Pruning for Federated Learning," The 37th AAAI Conference on Artificial Intelligence, February 2023.

[45] P. Sen, X. Jiang, Q. Wu, M. Talasila, W.-L. Hsu, C. Borcea, "Indoor Place Prediction on Smart Phones," Demo Abstract. The 20th ACM Conference on Embedded Networked Sensor Systems (SenSys 2022), November, 2022.

[46] X. Jiang, S. Zhao, G. Jacobson, R. Jana, W-L. Hsu, M. Talasila, S. A. Aftab, Y. Chen, and C. Borcea, "Federated Meta-Location Learning for Fine-Grained Location Prediction," IEEE International Conference on Big Data (IEEE BigData 2021), December 2021.

[47] S. Zhao, R. Bharati, C. Borcea, and Y. Chen, "Privacy-Aware Federated Learning for Page Recommendation," IEEE International Conference on Big Data (IEEE BigData 2020), December 2020.

[48] S. Zhao, X. Jiang, G. Jacobson, R. Jana, W-L. Hsu, R. Rustamov, M. Talasila, S. A. Aftab, Y. Chen, and C. Borcea, "Cellular Network Traffic Prediction Incorporating Handover: A Graph Convolutional Approach," The 17th Annual IEEE International Conference on Sensing, Communication and Networking (SECON), June 2020.

[49] S. Zhao, A. Kalra, C. Borcea, and Y. Chen, "To be Tough or Soft: Measuring the Impact of Counter-Ad-blocking Strategies on User Engagement," The Web Conference (WWW), April 2020.

[50] T. Zhang, Y.-H. Chiang, C. Borcea, and Y. Ji. "Learning-based Offloading of Tasks with Diverse Delay Sensitivities for Mobile Edge Computing". IEEE Global Communications Conference (GLOBECOM 2019), December 2019.

[51] S. Zhao, A. Kalra, C. Wang, C. Borcea, and Y. Chen, "Ad Blocking Whitelist Prediction for Online Publishers," The 2019 IEEE International Conference on Big Data (IEEE Big Data), December 2019.

[52] A. Hakeem, N. Gehani, X. Ding, R. Curtmola, and C. Borcea, "Multi-Destination Vehicular Route Planning with Parking and Traffic Constraints," The 16th EAI International Conference on Mobile and Ubiquitous Systems: Computing, Networking and Services (MobiQuitous 2019), November 2019.

[53] A. Kalra, C. Wang, C. Borcea, and Y. Chen. "Reserve Price Failure Rate Prediction with Header Bidding in Display Advertising". The 25th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD 2019), August 2019.

[54] D. Scotece, N. Paiker, L. Foschini, P. Bellavista, X. Ding, and C. Borcea. "MEFS: Mobile Edge File System for Edge-Assisted Mobile Apps". 20th IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks (IEEE WoWMoM 2019), June 2019.

[55] S. Zhao, M. Talasila, G. Jacobson, C. Borcea, S. Aftab, and J. Murray. "Packaging and Sharing Machine Learning Models via the Acumos Open Platform". The 17th IEEE International Conference on Machine Learning and Applications (ICMLA 2018), December 2018.

[56] N. Paiker, X. Ding, R. Curtmola and C. Borcea. "Context-Aware File Discovery System for Distributed Mobile-Cloud Apps". The 10th IEEE International Conference on Cloud Computing Technology and Science (CloudCom 2018), December 2018.

[57] H. Debnath, G. Gezzi, A. Corradi, N. Gehani, X. Ding, R. Curtmola, C. Borcea. "Collaborative Offloading for Distributed Mobile-Cloud Apps". The 6th IEEE International Conference on Mobile Cloud Computing, Services, and Engineering (MobileCloud '18), March 2018.

[58] H. Debnath, N. Gehani, X. Ding, R. Curtmola, C. Borcea. "Sentio: Distributed Sensor Virtualization for Mobile Apps". IEEE International Conference on Pervasive Computing and Communication (PerCom '18), March 2018.

[59] A. Hakeem, N. Gehani, R. Curtmola, X. Ding and C. Borcea, "Cooperative System for Free Parking Assignment". IEEE Vehicular Networking Conference (VNC), November 2017.

[60] S. Zhao, C. Wang, A. Kalra, L. Vaks, C. Borcea, Y. Chen. "Ad Blocking and Counter-Ad Blocking: Analysis of Online Ad Blocker Usage". The 23rd Americas Conference on Information Systems (AMCIS 2017), Emergent Research Forum, August 2017.

[61] P. Neog, H. Debnath, J. Shan, N. Paiker, N. Gehani, R. Curtmola, X. Ding, and C. Borcea. "FaceDate: A Mobile Cloud Computing App for People Matching". Proceedings of the 7th EAI International Conference on MOBILe Wireless MiddleWARE, Operating Systems, and Applications (Mobilware), December 2016.

[62] A. Hakeem, N. Gehani, R. Curtmola, X. Ding, and C. Borcea. "On-The-Fly Curbside Parking Assignment". Proceedings of the 8th EAI International Conference on Mobile Computing, Applications and Services (MobiCASE), December 2016.

[63] C. Wang, A. Kalra, C. Borcea, and Y. Chen. "Webpage Depth-level Dwell Time Prediction". Proceedings of the 25th ACM International Conference on Information and Knowledge Management (CIKM 2016), October 2016.

[64] M. A. Khan, H. Debnath, and C. Borcea. "Balanced Content Replication in Peer-to-Peer Online Social Networks". Proceedings of the 9th IEEE International Conference on Social Computing and Networking, October 2016.

[65] N. Almalki, R. Curtmola, X. Ding, N. Gehani, and C. Borcea. "P2F2: Privacy-Preserving Face Finder". Proceedings of the 37th IEEE Sarnoff Symposium, September 2016.

[66] D. H. Ton That, I. Sandu Popa, K. Zeitouni, and C. Borcea. "PAMPAS: Privacy-Aware Mobile Participatory Sensing Using Secure Probes". Proceedings of the 28th International Conference on Statistical and Scientific Database Management, July 2016.

[67] J. Shan, N. Paiker, X. Ding, N. R. Gehani, R. Curtmola, and C. Borcea. "An Overlay File System for Cloud-Assisted Mobile Applications". Proceedings of the 32nd International Conference on Massive Storage Systems and Technology (MSST 2016), May 2016.

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[70] C. Wang, A. Kalra, C. Borcea,and Y. Chen. "Viewability Prediction for Online Display Ads". Proceedings of the 24th ACM International Conference on Information and Knowledge Management (CIKM 2015), 2015.

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[73] R. Liu, H. Liu, D. Kwak, Y. Xiang, C. Borcea, B. Nath, and L. Iftode, "Themis: A Participatory Navigation System for Balanced Traffic Routing". Proceedings of the IEEE Vehicular Networking Conference (VNC'14), December 2014.

[74] M. Talasila, R. Curtmola, and C. Borcea. "Alien vs. Mobile User Game: Fast and Efficient Area Coverage in Crowdsensing". Proceedings of the 6th International Conference on Mobile Computing, Applications and Services (MobiCASE), November 2014.

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[76] Md. Haque, Y. Hassan, A. Aziz, C. Borcea, and S. Yamada. "Route Caching in DTNs Interconnected by Infrastructure". Proceedings of the Australasian Telecommunication Networks and Applications Conference (ATNAC '13), November 2013.

[77] H. Debnath and C. Borcea. "TagPix: Automatic Real-time Landscape Photo Tagging For Smartphones". Proceedings of the 6th International Conference on Mobile Wireless Middleware, Operating Systems, and Applications (Mobilware 2013), November 2013.

[78] M. Talasila, R. Curtmola, and C. Borcea, "Improving Location Reliability in Crowd Sensed Data with Minimal Efforts". Proceedings of the 6th Joint IFIP/IEEE Wireless and Mobile Networking Conference (WMNC '13), April 2013.

[79] F. Yasmeen, N. Huda, Cristian Borcea, and Shigeki Yamada, "Ferry Access Points and Sticky Transfers: Improving Communication in Ferry-assisted DTNs". Proceedings of the IEEE WoWMoM Workshop on Autonomic and Opportunistic Computing (AOC 2012), June 2012.

[80] H. Togashi, C. Borcea, and S. Yamada, "Lane Recognition for Moving Vehicles Using Multiple On-car RFID Receiver Antennas - Algorithm and Its Experimental Results", Proceedings of the 2012 IEEE Intelligent Vehicles Symposium (IV '12), June 2012.

[81] J. Pan, M. A. Khan, I. Sandu-Popa, K. Zeitouni, and C. Borcea, "Proactive Vehicle Rerouting Strategies for Congestion Avoidance", Proceedings of the 8th IEEE International Conference on Distributed Computing in Sensor Systems (DCOSS '12), May 2012.

[82] D. Boston and C. Borcea, "TIE: Temporal Interaction Explorer for Co-presence Communities", Proceedings of the International Conference on Social Computing and its Applications (SCA 2011), December 2011.

[83] J. Pan, D. Boston, and C. Borcea, "Analysis of Fusing Online and Co-presence Social Networks", Proceedings of the 2nd IEEE Workshop on Pervasive Collaboration and Social Networking (PerCol 2011), March 2011.

[84] N. Kourtellis, J. Finnis, P. Anderson, J. Blackburn, C. Borcea, and A. Iamnitchi, "Prometheus: User-Controlled P2P Social Data Management for Socially-Aware Applications", Proceedings of the 11th ACM/IFIP/USENIX International Middleware Conference (Middleware 2010), December 2010.

[85] M. Talasila, R. Curtmola, and C. Borcea, "LINK: Location verification through Immediate Neighbors Knowledge", Proceedings of the 7th International ICST Conference on Mobile and Ubiquitous Systems (MobiQuitous 2010), Springer LNICST 73.

[86] S. Mardenfeld, D. Boston, J. Pan, Q. Jones, A. Iamnitchi, and C. Borcea, "GDC: Group Discovery using Co-location Traces", Proceedings of the 2nd IEEE Symposium on Social Computing Applications (SCA-10), August 2010.

[87] N. Rajgure, E. Platon, C. Borcea, and S. Honiden, "Geographical Data Collection in Sensor Networks with Self-Organizing Cluster-Heads". Proceedings of the 24th ACM Symposium on Applied Computing (SAC), the Track on Self-Organizing Pervasive Distributed Systems (SOPDS), March 2009.

[88] C. Borcea and A. Iamnitchi, "P2P Systems Meet Mobile Computing: A Community-Oriented Software Infrastructure for Mobile Social Applications". Proceedings of the IEEE Workshop on Decentralized Self-Management for Grids, P2P, and User Communities (SELFMAN) organized in conjunction with the 2nd IEEE International Conference on Self-Adaptive, Self-Organizing Systems (SASO), October 2008.

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[90] C. Borcea, A. Gupta, A. Kalra, Q. Jones, and L. Iftode "The MobiSoC Middleware for Mobile Social Computing: Challenges, Design, and Early Experiences". Proceedings of the 1st International Conference on Mobile Wireless Middleware, Operating Systems, and Applications (Mobilware 2008), February 2008.

[91] G. Xu, C. Borcea, and L. Iftode, "Trusted Application Centric Ad Hoc Networks". Proceedings of the 4th IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS 2007), October 2007.

[92] A. Anand, C. Manikopoulos, Q. Jones, and C. Borcea, "A Quantitative Analysis of Power Consumption for Location-Aware Applications on Smart Phones". Proceedings of the IEEE International Symposium on Industrial Electronics (ISIE 2007), June 2007.

[93] G. Xu, C. Borcea, and L. Iftode, "Satem: Trusted Code Execution across Transactions". Proceedings of the 25th IEEE Symposium on Reliable Distributed Systems (SRDS '06), October 2006.

[94] Q. Jones, C. Borcea, R. Hiltz, B. Amento, and C. Manikopoulos, "Urban Enclave Location-Aware Social Computing". Proceedings of Association of Internet Researchers Conference, Internet Research 7.0: Internet Convergences, Brisbane, Australia, September 2006.

[95] T. Nadeem, P. Zhou, P. Kang, C. Borcea, and L. Iftode, "EZCab: A Cab Booking Application Using Short-Range Wireless Communication". Proceedings of the 3rd IEEE International Conference on Pervasive Computing and Communications (PerCom '05), March 2005.

[96] N. Ravi, C. Borcea, P. Kang, and L. Iftode, "Portable Smart Messages for Ubiquitous Java-Enabled Devices". Proceedings of the 1st International Conference on Mobile and Ubiquitous Systems: Networking and Services (MobiQuitous 2004), August 2004.

[97] S. Dashtinezhad, T. Nadeem, B. Dorohonceanu, C. Borcea, P. Kang, and L. Iftode, "TrafficView: A Driving Assistant Device for Traffic Monitoring based on Car-to-Car Communication". Proceedings of the 59th Semiannual Vehicular Technology Conference (VTC Spring '04), May 2004, Vol. 5.

[98] L. Iftode, C. Borcea, N. Ravi, P. Kang, P. Zhou, "Smart Phone: An Embedded System for Universal Interactions". Proceedings of the 10th IEEE International Workshop on Future Trends of Distributed Computing Systems (FTDCS '04), May 2004.

[99] C. Borcea, C. Intanagonwiwat, P. Kang, U. Kremer, and L. Iftode, "Spatial Programming using Smart Messages: Design and Implementation". Proceedings of the 24th International Conference on Distributed Computing Systems (ICDCS '04), March 2004.

[100] L. Iftode, C. Borcea, A. Kochut, C. Intanagonwiwat, and U. Kremer, "Programming Computers Embedded in the Physical World". Proceedings of the 9th IEEE International Workshop on Future Trends of Distributed Computing Systems (FTDCS '03), May 2003.

[101] G. Xu, C. Borcea, and L. Iftode, "Toward a Security Architecture for Smart Messages: Challenges, Solutions, and Open Issues". Proceedings of the 1st IEEE International Workshop on Mobile Distributed Computing (MDC '04), May 2003.

[102] C. Borcea, C. Intanagonwiwat, A. Saxena, and L. Iftode, "Self-Routing in Pervasive Computing Environments using Smart Messages". Proceedings of the 1st IEEE International Conference on Pervasive Computing and Communications (PerCom '03), March 2003.

[103] C. Borcea, D. Iyer, P. Kang, A. Saxena, and L. Iftode, "Cooperative Computing for Distributed Embedded Systems". Proceedings of the 22th International Conference on Distributed Computing Systems (ICDCS '02), Jul 2002.

[104] P. Stanley-Marbell, C. Borcea, K. Nagaraja, and L. Iftode, "Smart Messages: A System Architecture for Large Networks of Embedded Systems," Proceedings of the 8th Workshop on Hot Topics in Operating Systems (HotOS-VIII), May 2001, Position Summary.

- **Book Chapters**

[102] X. Jiang, H. Mohammadi, C. Borcea, N. Phan, "ZoneFL: Zone-based Federated Learning at the Edge," Book chapter in the "Handbook of Trustworthy Federated Learning", Springer International Publishing, ISBN 9783031589225, 2024.

[103] M. Talasila, R. Curtmola, and C. Borcea, "Mobile Crowd Sensing". Chapter in the Handbook of Sensor Networking: Advanced Technologies and Applications, CRC Press, SBN 9781466569713, 2015.

[104] J. Pan and C. Borcea, "Vehicular Sensor Networks". Chapter in the Handbook of Sensor Networking: Advanced Technologies and Applications, CRC Press, SBN 9781466569713, 2015.

[105] L. Iftode, C. Borcea, and P. Kang, "Cooperative Computing in Sensor Networks". Chapter in the Handbook of Sensor Networks: Compact Wireless and Wired Sensing Systems, Mohammad Ilyas (ed.), CRC Press, ISBN 9780849319686, 2004, pages 26.1-26.19.

- **Education Related Refereed Conference Papers**

[106] T. Hall, W. Jabi, K. Passerini, C. Borcea, and Q. Jones, "An Interactive Poster System to Solicit Casual Design Feedback". Proceedings of the ACADIA 2008 Conference of the Association for Computer Aided Design in Architecture, October 2008.

[107] W. Jabi, T. Hall, K. Passerini, C. Borcea, and Q. Jones, "Exporting the Studio Model of Learning: Teaming Architecture with Computer Science". Proceedings of the eCAADe 2008 Conference on Education and Research in Computing Aided Architectural Design in Europe, September 2008.

[108] W. Jabi, C. Borcea, T. Hall, and K. Passerini. "Early Experiences with Interdisciplinary Design Studios". Proceedings of the NSF Creative IT Workshop, January 2008.

[109] W. Jabi, C. Borcea, Q. Jones, and K. Passerini, "Ubiquitous Social Computing Technologies to Foster Design Thinking and Creativity". Proceedings of the Creativity and Cognition 2007 Workshop on Tools in Support of Creative Collaboration, June 2007.

[110] W. Jabi, C. Borcea, Q. Jones, and K. Passerini, "SmartCampus-Studio: Fostering Creativity and Design Thinking with Ubiquitous Social Computing Technologies". Proceedings of the ACM CHI 2007 Workshop on Supporting Design Studio Culture in HCI, April 2007.

Patents

[1] M. Talasila, A. S. Aftab, W.-L. Hsu, C. Borcea, Y. Chen, X. Jiang, S. Zhao, G. Jacobson, R. Jana, "Artificial Intelligence Automation to Improve Network Quality Based on Predicted Locations." Patent No. US 11,848,828 B1, 2023.

[2] G. Xu, C. Borcea, L. Iftode, "Method and System for Policy Enfocement in Trusted Ad Hoc Networks." Patent No. US 10,693,853 B2, 2020.

Invited Talks/Lectures/Tutorials

- "Federated Learning for Mobile and IoT Devices," Shanghai Normal University, December 2023.

- "Federated Learning for Mobile and IoT Devices," National Institute of Informatics, Tokyo, Japan, November 2023.

- "Federated Learning for Mobile Sensing Data," Keynote talk at the 2021 IEEE International Congress on Intelligent and Service-Oriented Systems Engineering (CISOSE), August 2021.

- "Federated Learning for Mobile Sensing Data," Keynote talk at 22nd IEEE International Conference on Mobile Data Management (MDM'21), June 2021.

- "Offloading Computation and Storage for Distributed Mobile Apps in Mobile-Edge-Cloud Environments", National Institute of Informatics, Tokyo, Japan, October 2018.

- "Distributed Mobile Cloud Computing with Avatars", Keynote talk at the 2018 Joint IEEE Conferences on Mobile Cloud, Big Data Service, and Service-Oriented System Engineering. March 2018.

- "Cloud Platforms: Trends, Challenges, Opportunities", SAP, New York City, December 2017.

- "File Systems and Sensor Virtualization for Mobile Cloud Computing," National Institute of Informatics, Tokyo, Japan, March 2017.

- "Mobile Computing and Crowdsensing with Avatars and Aliens," University Politehnica Bucharest, Romania, December 2016.

- "Mobile Computing and Crowdsensing with Avatars and Aliens," CTIF Global Capsule (CGC) Kickoff Event, Newark, NJ, Spetember 2016.

- "Mobile Computing and Crowdsensing with Avatars and Aliens," National Institute of Informatics, Tokyo, Japan, November 2015.

- "Mobile Computing and Crowdsensing with Avatars and Aliens," Dauphine University, Paris, France, June 2015.

- "Mobile Computing and Sensing with Avatars and Aliens," CCS Board of Visitors, Newark, NJ, April 2015.

- "Living the Ubiquitous Computing Dream: Mobile Computing and Sensing with Phones and Cars", University of Bologna, January 2012.

- "Perspectives on Mobile Computing: Present and Future", National Institution of Information and Communication Technology, Tokyo, Japan, November 2011.

- "Distributed Programming in People-Centric Mobile Ad Hoc Sensor Networks", Waseda University, Tokyo, Japan, October 2011.

- "Mobile Computing: State-of-the-Art and Future Trends", Lecture Series, National Institute of Informatics, Tokyo, Japan, September-October 2011.

- "Programming Mobile Ad Hoc Networks", Workshop on Mobile Ad Hoc Networks, Telecom ParisTech University, Paris, France, June 2011.

- "Programming Mobile Ad Hoc Networks and Other Mobile Computing Stories", University of Versailles Saint-Quentin-en-Yvelines, France, June 2011

- "Is Your Car Talking with My Smart Phone? or Distributed Sensing and Computing in Mobile Networks", Stevens Institute of Technology, NJ, November 2008

- "Spatial Approaches to Pervasive Computing" Tutorial at the 2nd IEEE International Conference on Self-Adaptive, Self-Organizing Systems (SASO), Venice, Italy, October 2008. With J. Bachrach, J. Beal, and M. Mamei

- "Is Your Car Talking with My Smart Phone? or Distributed Sensing and Computing in Mobile Networks" Create-Net International Research Center, Trento, Italy, October, 2008

- "Middleware Platforms for Mobile Social Computing", The 3rd University of Helsinki - Rutgers Workshop on Spontaneous Networking (HRW), May 2008, Rutgers University, NJ, May 2008

- "Is Your Car Talking with My Smart Phone? or Distributed Sensing and Computing in Mobile Networks", University of South Florida, FL, February 2008

- "Mobile Computing in Urban Environments" UPS Research and Development Center, Mahwah, NJ, August 2007

- "Mobile Social Computing in Urban Enclaves" NSF Mobile Wireless Workshop for USA-Finland Collaboration, Helsinki, Finland. NSF Mobile Wireless Workshop for USA-Sweden Collaboration, Stockholm, Sweden, May 2007

- "Distributed Programming in People-Centric Mobile Sensor Networks" NSF Mobile Wireless Workshop for USA-Finland Collaboration, Helsinki, Finland, May 2007

- "Exploring the Design and Implementation of Vehicular Networked Systems", NSF NeTS PI Meeting, Los Angeles, CA, August 2006

- "Turning Ad Hoc Network into Distributed Service Providers", Department of Computer Science, University of Texas at San Antonio, August 2006

- "Outdoor Distributed Computing", Workshop on Spontaneous Networking, Rutgers University, May 2006

- "Pervasive Computing Systems", Bergen County Academies, Hackensack, NJ, May 2006

- "Pervasive Computing Systems", New Jersey High School Programming Contest, Newark, NJ, March 2006

- "Outdoor Distributed Computing", The Joint Meeting of the Princeton ACM and IEEE CS Chapter. Princeton, NJ, March 2005

Grants

- Understanding the Impact of Privacy Interventions on the Online Publishing Ecosystem, NSF (CNS 2237328), $600,000. Co-PI. 2023-2026.

- FedX: Personalizing Compression for Edge-based Federated Learning, Qualcomm, $100,000. Co-PI, 2022-2023.

- NJIT Secure Computing Initiative (Renewal). NSF (DGE 2043104), $4,579,647. Co-PI. 2021-2026.

- Zone-based Federated Learning, Qualcomm, $100,000, Co-PI, 2021-2022.

- Federated Learning for Human Activity Prediction in the Wild, Qualcomm. $100,000. Co-PI. 2020-2021

- NJIT Secure Computing Initiative. NSF (DGE 1565478), $4,078,362. Co-PI. 2015-2021.

- AI Techniques and Platforms for Wireless Networks, AT&T, $20,000. PI. 2018-2019.

- Mobile Distributed Computing in the Cloud. NSF (CNS-1409523), $599,999. PI. 2014-2018.

- CAE Cybersecurity Research: PARAPET-Preventing Attempted exfiltRation and infiltration using encryPtED signaTures. NSA (H98230-15-1-0274), $297,387. Co-PI. 2015-2016.

- Mobius: A Multi-Tier Socially-Aware Network Infrastructure. NSF (CNS-0831753), $409,978. PI. 2008-2012.

- On-road Real-time Information Systems for Driving Safety atop VANET-WSN Symbiosis. NSF (CNS-0834585). $70,000. Co-PI. 2008-2010.

- Using GeoTemporal Social Matching to Support Community. NSF (IIS-0534520). $749,608. Co-PI. 2005-2009.

- CRI: SmartCampus - A Wireless Mobile Community System with People-To-People-To-Places Services. NSF (CNS-0454081). $791,998 with NJIT matching funds $158,400. Co-PI. 2005-2009.

- Fostering Creativity in Ubiquitous Social Computing through Casual and Formal Interactions in Interdisciplinary Design Studios. NSF (IIS-0714158). $198,598. Co-PI. 2007-2008.

- Exploring the Design and Implementation of Vehicular Networked Systems. NSF (CNS-0520033). $225,000. PI. 2005-2009.

Teaching Experience

- **Courses Developed & Taught**

  - Created and taught three graduate courses: "643 Cloud Computing," "CS 756 Mobile Computing and Sensor Networks," and "CS 786 Mobile Cloud Computing.

  - Proposed and developed an undergraduate interdisciplinary studio course on "CS 486 Ubiquitous Computing" (in collaborations with colleagues from Information Systems, Architecture, and Management)

  - Other courses taught: "CS 656 Internet and Higher Layer Protocols" (graduate), "CS 652 Network Architectures and Protocols" (graduate), and "CS 356 Introduction to Computer Networks" (undergraduate)

- **Student Advisement**

  - Graduated 12 Ph.D. students and 30+ M.S. students
  - Currently advising 3 Ph.D. students and 13 MS students
  - Ph.D. Thesis Committee Member for 40+ students

Professional Service

- **Leadership Roles in Conference**

  - General Chair: 44th IEEE International Conference on Distributed Computing Systems (ICDCS), 2024; 21st IEEE Mobile Data Management (MDM), 2020; 5th IEEE Mobile Cloud, 2017.
  - Technical Program Committee Chair: The 15th EAI MobiQuitous, 2018; 4th IEEE Mobile Cloud, 2016; 5th ICST Mobilware, 2012.
  - Technical Program Committee Track Chair: 16th IEEE International Conference on Mobility, Sensing and Networking (MSN 2020)
  - Program Committee Member: ICDCS, DSN, ACM/IEEE IWQoS, IEEE MASS, IEEE SASO, IEEE ICC, MDM, etc. (**Over 70 conferences in total**)

- **Funding Agencies Panelist/Reviewer**

  - National Science Foundation, USA, Panelist - 2019, 2018, 2017, 2013, 2012, 2010, 2009, 2006
  - Israel Science Foundation, Reviewer - 2019
  - European Science Foundation, EU, Reviewer - 2012
  - Portuguese Foundation for Science and Technology, Reviewer - 2012
  - National Research Agency, France, Reviewer - 2010
  - Academy of Finland Proposal, Reviewer - 2008

Selected University and Department Service

- Co-Chair of NJIT Cyber Security Research Focus Group, 2015, Co-Chair of one of the NJIT Strategic Planning Subcommittees, 2009

- NJIT Budget Redesign Working Group, 2023; CFO Search Committee, 2015

- YWCC Dean Search Committee, 2013

- Chair of CS Faculty Recruiting Committee, 2019-2020, 2014-2015, 2012-2013, 2008-2009. Member of CS Faculty Recruting Committee in many years.

- Chair of the CS Teaching Committee, 2009-2011

- Chair of CS Undergraduate Education Committee and Department Representative on NJIT Committee on Undergraduate Education, 2012-2015

External Letter Writer for Promotion and Tenure Cases

- SUNY Binghamton University, George Mason University, Old Dominion University, CUNY Hunter College.

Honors and Awards

- NJIT Student Senate Award for Ying Wu College of Computing Faculty, 2018

- NJIT College of Computing Sciences, Gold Service Award, 2013

- NJIT Excellence in Teaching Award for Graduate Instruction, 2009.

Professional Affiliations

- ACM, IEEE.