

Mudhakar Srivatsa

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RESEARCH INTERESTS

Cognitive Internet of Things, Spatiotemporal Analytics, Big Data, Secure Information Flow

RESEARCH EXPERIENCE AND EDUCATION

- **IBM T.J. Watson Research Center**, Yorktown Heights, NY, USA
Distinguished Research Staff Member, Distributed AI, 2018–present
Principal Research Staff Member, Cognitive IoT, 2016–18
Research Manager, IoT Analytics, 2014–present
Research Staff Member, 2007–present
Research on *Spatiotemporal and Graph Analytics* – making sense out of large scale network data.
- **US/UK International Technology Alliance (ITA: <http://www.usukita.org/>)**
Jointly funded by US Army Research Lab (ARL) and UK Ministry of Defence (MoD)
Consortium technical area leader on *Coalition Interoperable Secure and Hybrid Networks*, May 2011–2016
Principal Investigator and task lead on *Secure Information Flow* and *Game Theoretic Security*, May 2009–2011
Principal Investigator on *Secure Information Flow*, May 2007–2009
- **Network Science Collaborative Technology Alliance (NS-CTA: <http://www.ns-cta.org/>)**
Funded by US Army Research Lab (ARL)
IBM Program Manager for *Information Network Academic Research Center (INARC)*, Jan 2011–present
Task lead on *Modeling Socio-Information Networks*, Sep 2009–present
- **College of Computing, Georgia Institute of Technology**, Atlanta, GA, USA
Ph.D. in Computer Science, Spring 2007
Thesis: *Security Architectures and Protocols for Overlay Network Services*; GPA: 4.0/4
- **Indian Institute of Technology (IIT), Madras**, Chennai, India
B. Tech in Computer Science and Engineering with a minor in Operations Research, May 2002
Thesis: *ARM: Adaptive Resource Management*; Major GPA: 9.5/10

PROFESSIONAL ACTIVITIES

- Editor: IEEE Transactions on Emerging Topics in Computing, ACM/Springer Wireless Networks (2009–present), IJAACS (2008)
- Program chair: SMDS (2021), CogMI (2020), Edge (2020), DAIS Workshop (2019), ICDCS – applications track (2018), CIC (2018), SecureComm (2014), CollaborateCom (2018, 2012-13), ACITA Workshops (2011), IEEE ICSCN (2008), IEEE QoISN (2008).
- Communication and Networking PIC Chair (Professional Interest Community) at IBM Research (2011–13)
- Member of review panels for NSF: 2012, 2013, 2014, 2015, 2017, 2018, 2019.
- Member of review panel for National Council for Research and Development, Romania: Joint Applied Research Projects 2011-12
- Member of review panel for National Commission for Scientific and Technological Development (CONICYT), Chile: National Research Funding Competition (2011-12)

- Member of review panel for MURI (Multi-University Research Initiative) Trust Program for ONR (Office of Naval Research).
- Program committee member: WWW (2018), KDD (2019, 2018, 2017, 2016), CIKM (2018, 2017), SocialSense (2018), IJCAI (2021, 2020, 2019, 2017), IFIP Networking (2019), CSF (2015), MILCOM (2015), ICNP (2014), SACMAT (2011), ICDCS (2017, 2011), GameSec (2010), ICDM (2009), AAAI QRASA (2009), CoopIS (2008), ICDCS TRAM (2007, 2008), CollaborateCom (2007, 2008, 2009, 2010), EDA-PS (2007).
- External reviewer for journals: ACM TISSEC, ACM TOCS, IEEE Computer, IEEE TPDS, IEEE TKDE, IEEE/ACM ToN, IEEE Intelligent Systems, Wireless Networking Journal, VLDB Journal, JPDC, ACM Transactions on the Web, Elsevier Information Systems, IJCSSE.
- External reviewer for conferences: ACSAC (2004, 2005, 2006), VLDB (2005), ICDCS (2003, 2005, 2007), ICDCN (2006), Globecom (2004), SIGMOD (2004, 2007), ICDE (2004, 2006, 2007), KDD (2006), WWW (2007).
- Senior Member of IEEE, ACM and USENIX.
- Dissertation Committee: Yiran Zhao (UIUC), Tanvir Al Amin (UIUC), Daniel de Godoy (Columbia)

SOFTWARE PROTOTYPES

- Spatiotemporal analytics toolkit (C++ and Java): design and development of real-time spatiotemporal analytics (including, support for full Earth ellipsoidal model, motion processing). Ships with IBM Cloud SQL Query, Q-Radar DNS Volumetrics, Customer Care Solution in IBM Cloud Private for Data (ICP4D), Watson Studio Streams Designer, Db2 warehouse, Db2 warehouse on cloud, Db2 on cloud, IBM Integrated Analytics System (IIAS), TWC Longship Location Insights platform, TWC Travel Time Forecast, IBM Streams v4.0, BigInsights v4.0, SPSS Modeler v16, Sensemaking, System G (graph database) and BlueMix Geospatial services.
- Design of HDFS transparency over GPFS: a zero-copy solution that allows both analytical (e.g., Hadoop, Spark) workloads and transactional workloads (e.g., RDBMS) to operate (read/write) concurrently on a shared file. Ships with IBM Spectrum Scale v4.2.
- Streaming algorithms for network analytics (C++): implementation of a suite of wire-speed (1 Gbps) network analytics algorithms (including, opinion mining, social graph mining, trending and tracking popular topics) on both traditional CPUs (x86 and Power PC) and network processors (PowerEN); showed 7x speed up in performance via exploitation of multi-threading and hardware acceleration.
- Streaming network fault diagnosis and prediction (C++ and Java): implementation of temporal sub-graph matching algorithms to handle bursts of network events in large enterprise networks and ISPs; offers a 2.4x speedup and enables incremental and predictive fault diagnosis and localization.
- Distributed root cause analysis module (Perl and SQL) for IBM Tivoli Network Manager: offers super-linear speedup by distributing root cause analysis.
- Distributed network discovery module (Perl) for IBM Tivoli Network Manager: reduces the number of network probes required by 90%.

INVITED TALKS

- Hype and Promise of AI in Networking, ICCCN Panel Moderator, 2022
- Process Calculus for Scaling AI/ML Pipelines, IPDPS Scalable Deep Learning Workshop, 2022
- Scaling AI/ML Pipelines using CodeFlare, Deep Learning Workshop, ACM Middleware, 2021

- Scaling AI using Ray pipelines, Spark Summit and Ray Summit, 2021
- Change detection on Remote Sensing Data, Ray Summit, 2021
- AI-assisted Air Traffic Control, Univ of Tübingen, May 2021
- Cognitive Machine Intelligence panel: Edge AI, Dec 2019
- AI Challenge IoT panel at Sensys: Edge AI, Nov 2019
- ESWEEK: Internet of Medical Things - Challenges, Oct 2019
- Keynote speaker at ICCCN: Edge AI for 5G Networks, July, 2019
- Department of Transportation: Use based Insurance, May 2019
- Watson IoT Exchange: AI at Edge, Apr 2019
- Columbia University: Deep Hash Codes, Mar 2019
- Think 2019: AI/ML for Customer Journey Analytics, Feb 2019
- Keynote speaker at Advanced Practices Council: AI at Edge, Jan 2019
- IEEE CIC 2018: Tutorial on AI at Edge, Oct 2018
- Univ of Georgia: AI at Edge, Mar 2018
- Army Research Lab: Learning and Reasoning in Complex Data Environments, Dec 2017
- Georgia Tech: IoT at Edge, Sep 2017
- Univ of Southern California: Decentralized Search on Scale Free Networks, Mar 2017
- Panelist at Military Communications (MILCOM): Autonomy in Next Generation Information Networks, Nov 2016
- College of William and Mary and Univ of Maryland: Using Graphs as Side Channels, Oct 2015
- Keynote speaker at IBM Enterprise 2014: Asteroid tracking, Oct 2014
- Singapore Management University: Real-time Spatiotemporal Analytics, Nov 2013.
- Texas Wireless Summit (TWS): On Spatiotemporal Big Data, Oct 2013.
- Contextual computing Workshop and Mobile First Workshop: On Real-time Analytics using Spatiotemporal Toolkit, Apr 2013.
- CMU and UPitt: On Social Networks as Side Channels, Oct 2012.
- Keynote Speaker at IEEE Intl Conference on Advanced Computing (ICoAC): On Spatio-temporal Analytics of Mobile Sensor Network Traces, Dec 2011.
- University of Texas at Austin and University of Washington: Revocation Games, Mar and Jul 2010.
- Plenary Speaker at IEEE ICSCN 2008: Who is Listening? Security in Wireless Networks, Jan 2008
- Texas A&M University: Project SGuard, Apr 2007
- University of Arizona, Tucson: Security Architectures and Protocols for Overlay Network Services, Mar 2007
- AT&T Labs and NEC Labs: Caller Identification Attacks in VoIP Networks, Feb 2007

AWARDS AND HONORS

- IBM Recognition Experience Honoree (Best-of-IBM) (2021)
- IBM Outstanding Accomplishment Award for contributions to IBM Analytics Offerings on Public and Private Cloud (2020)
- IBM Corporate Award for contributions to spatiotemporal machine learning (2020)
- IBM Outstanding Product Accomplishment Award (10M+ research impact) for contributions to timeseries analytics and machine learning (2019)
- IBM Outstanding Science Accomplishment Award for research contributions to mobile crowdsensing (2018)
- IBM Outstanding Product Accomplishment Award (10M+ research impact) for contributions to spatiotemporal machine learning in TWC Longship platform, Db2 Warehouse and IBM Integrated Analytics Server (IIAS) (2018)
- IBM Outstanding Customer Engagement Accomplishment Award (25M+ research impact) for contributions to Customer Journey Analytics (2018)
- IBM Research Division Award for scientific contributions to scalable dynamic graph algorithms (2018)
- IBM Outstanding Science Accomplishment Award for research contributions to information dissemination in edge networks (2017)
- IBM Outstanding Science Accomplishment Award for research contributions to application-level denial of service (DoS) attacks (2016)
- IBM Research Division Award (10M+ research impact) for contributions to big data analytics on Spectrum Scale (2016)
- IBM Outstanding Science Accomplishment Award for research contributions to location security using graphs as a side-channel (2015)
- IBM Outstanding Technical Accomplishment Award (10M+ research impact) for contributions to automotive (connected car) solutions using spatiotemporal analytics (2014)
- IBM Outstanding Technical Accomplishment Award (10M+ research impact) for contributions to telecommunication solutions using spatiotemporal analytics (2013)
- IBM 28th invention plateau award, 2022 (96 granted patents, 24 pending)
- IBM Master Inventor (Oct 2013-present)
- Certificate of academic distinction for securing the highest GPA from IIT Madras, 2000-01
- Technical accomplishment award from Cognizant Technologies and Solutions: implemented a one-shot mode real-time scheduler for eCOS (Embeddable and Configurable Operating System), 2001
- Merit award for top twenty students entering IIT Madras, 1998
- Silver medals in National Mathematics Olympiad, India, 1996 and 1997

TEACHING EXPERIENCE

- Graduate Teaching Assistant, Spring 2004, 2005 and 2006.
Teaching assistant for a graduate level course titled Internet Computing.
- Lectures in graduate level courses, such as: Advanced Internet Computing, Real-time and Embedded Systems and Reliability Theory.

PUBLICATION LIST

• Book Chapters

- Tuan M. Hoang Trong, **Mudhakar Srivatsa**, Dinesh Verma, Privacy-preserving product recommendation system on IBM Federated Learning Framework. In in Federated Learning: A Comprehensive Overview of Methods and Applications, Springer Nature, (book chapter), 2021.
- **Mudhakar Srivatsa** and Arun Iyengar. Application Level Denial of Service Attacks. In Springer Encyclopedia on Cryptography and Security (3rd Edition), 2021.
- Raghu Ganti and **Mudhakar Srivatsa**. Big Data and Data Mining for Wearable-based Mobility Analysis. In Big Data and Data Mining for Wearables, Elsevier Publications, 2020.
- **Mudhakar Srivatsa**, Dakshi Agrawal and Andrew McDonald. Security across Disparate Management Domains in Coalition MANETs. In Network Sciences for Military Coalition Operations, IGI Global Publications (July 2009).
- **Mudhakar Srivatsa** and Dakshi Agrawal. Security in Autonomic Networks. In Autonomic Computing and Networks, Springer Publications, 2008.

• Refereed Journal Publications

- Raghu Ganti, **Mudhakar Srivatsa**, Jeff Jonas and Dakshi Agrawal. STB: Space Time Boxes. In Transactions on Pervasive Computing and Interaction (TPCI), Apr 2019.
- Liang Ma, **Mudhakar Srivatsa**, Derya Cansever, Xifeng Yan, Sue Kase, Michelle Vanni. Performance Bounds of Decentralized Search in Expert Networks for Query Answering. In Transactions on Knowledge Discovery and Data Mining (TKDD), 2019.
- Christopher Simpkin, Ian Taylor, Graham Bent, Geeth De Mel, Swati Rallapalli, Liang Ma and **Mudhakar Srivatsa**. Constructing Distributed Time Critical Applications using Cognitive Enabled Services. In Future Generation Computer Systems (FGCS), 2018
- Shouling Ji, Weiqing Li, **Mudhakar Srivatsa** and Raheem Beyah. Structural Data De-anonymization: Theory and Practice. In ACM Transactions of Networking (ToN), Vol. 24, No. 6, Dec 2016.
- Kisung Lee, Raghu Ganti, **Mudhakar Srivatsa** and Ling Liu. Lightweight Indexing and Querying Services for Big Spatial Data. In IEEE Transactions on Services Computing (TSC), Dec 2016.
- Shouling Ji, Weiqing Li, **Mudhakar Srivatsa** and Raheem Beyah. General Graph Data De-anonymization: From Mobility Traces to Social Networks. In ACM Transactions on Information Systems Security (TISSEC), May 2016.
- Anthony Etuk, Timothy J. Norman, Murat Sensoy and **Mudhakar Srivatsa**. How to Trust a Few Among Many. In Journal of Autonomous Agents and Multi-Agent Systems, May 2016.
- Yongzhi Wang, Jingpeng Wei and **Mudhakar Srivatsa**. IntegrityMR: Integrity Assurance Framework for Big Data Analytics and Management Applications. In Intl Journal of Networked and Distributed Computing, Vol. 4, No. 2, pages 116 - 126, Apr 2016.
- Saritha Arunkumar, Murat Sensoy, **Mudhakar Srivatsa**, Muttukrishnan Rajarajan. Reasoning with streamed uncertain information from unreliable sources. In Journal of Expert Systems and Applications 42(22): 8381-8392, 2015.
- Saritha Arunkumar, **Mudhakar Srivatsa**, Muttukrishnan Rajarajan. A review paper on preserving privacy in mobile environments. In Journal of Network and Computer Applications 53: 74-90, 2015.
- Ziyu Guan, Shengqi Yang, Huan Sun, **Mudhakar Srivatsa** and Xifeng Yan. Fine-Grained Knowledge Sharing in Collaborative Environments. In IEEE Transactions on Knowledge and Data Engineering (TKDE) 27(8): 2163-74, Aug 2015.
- Yongzhi Wang, Jinpeng Wei and **Mudhakar Srivatsa**. Cross-cloud Map-Reduce: A Result Integrity Check Framework on Hybrid Clouds. In International Journal of Cloud Computing (IJCC) 2014.

- Wei Gao, Arun Iyengar, **Mudhakar Srivatsa** and Guohong Cao. Cooperative Caching for Efficient Data Access in Disruption Tolerant Networks. In *IEEE Transactions on Mobile Computing (TMC)* 13(3): 611-25, Mar 2014.
- Piotr Mardziel, Stephen Magill, Michael Hicks and **Mudhakar Srivatsa**. Dynamic Enforcement of Knowledge-based Security Policies using Abstract Interpretation. In *Journal of Computer Security (JCS)* 21(4): 463-532, Apr 2013.
- Petros Zerfos, **Mudhakar Srivatsa**, Hao Yu, Hubertus Francke and Dakshi Agrawal. Platform for Massive-Scale Streaming Network Analytics. In *IBM Journal for Research and Development: Special Edition on Massive Scale Analytics*, Jun 2012.
- Murtaza Zafer, Dakshi Agrawal and **Mudhakar Srivatsa**. Limitations of Generating a Secret Key Using Wireless Fading under Active Adversary. In *IEEE/ACM Transactions on Networking (ToN)* 20(5): 1440-51, May 2012.
- **Mudhakar Srivatsa**, Ling Liu and Arun Iyengar. EventGuard: A Dependable System Architecture for Securing Publish-Subscribe Networks. In *ACM Transactions on Computer Systems (TOCS)* 29(4) Dec 2011.
- **Mudhakar Srivatsa**, Arun Iyengar, Ling Liu and Hongbo Jiang. Privacy in VoIP Networks: Flow Analysis Attacks and Defense. In *IEEE Transactions on Parallel and Distributed Systems (TPDS)* 22(4): 621-33, Apr 2011.
- Aameek Singh, **Mudhakar Srivatsa** and Ling Liu. Search-as-a-Service: Outsourced Search over Outsourced Storage. In *ACM Transactions on the Web (TWEB)* 3(4), Dec 2009.
- **Mudhakar Srivatsa**, Arun Iyengar, Jian Yin and Ling Liu. Scalable Key Management Algorithms for Location-Based Services. In *IEEE/ACM Transactions on Networking (ToN)* 17(5): 1399-1412, May 2009.
- **Mudhakar Srivatsa** and Ling Liu. Mitigating Denial of Service Attacks on an Overlay Network: A Location Hiding Approach. In *IEEE Transactions on Parallel and Distributed Systems (TPDS)*, Vol. 20, No. 4, Apr 2009.
- **Mudhakar Srivatsa**, Arun Iyengar, Jian Yin and Ling Liu. Mitigating Application Level Denial of Service Attacks on Web Servers: A Client Transparent Approach. In *ACM Transactions on the Web (TWEB)*, Vol. 2, No. 3, July 2008.
 - * Briefing titled ‘A Two-Layer System Stops Intelligent Denial of Service Attacks’ appears in MIT Technology Review, Sept 2008 (<http://www.technologyreview.com/Infotech/21231/>).
 - * Short summary titled ‘On Smart Denial of Service Attacks’ to appear in *IEEE Computer Magazine*, 2009.
 - * Abridged version titled ‘Application Level Denial of Service Attacks’ in *Springer Encyclopedia on Cryptography and Security (2nd Edition)*, 2009.
- **Mudhakar Srivatsa**, Nithya Rajamani and Murthy V. Deverakonda. A Policy Evaluation Tool for Multi-Site Resource Management. To appear in *IEEE Transactions on Parallel and Distributed Systems (TPDS)*, Vol. 19, No. 10, Oct 2008.
- **Mudhakar Srivatsa** and Ling Liu. DHTGuard: Security Threats in Structured Overlay Networks. *Springer International Journal of Information Security*, 2006.
- **Mudhakar Srivatsa** and Ling Liu. Securing Decentralized Reputation Management using TrustGuard. *Journal on Parallel and Distributed Computing (JPDC)*, special issue on Security in Grid and Distributed Systems, Vol. 66, pp 1217-1232, 2006.
- **Mudhakar Srivatsa**, Bugra Gedik and Ling Liu. Scaling Unstructured Peer-to-Peer Networks with Heterogeneity Aware Topology and Routing. *IEEE Transactions on Parallel and Distributed Systems*, Vol 17, No. 10, Oct 2006.

• **Refereed Conference Publications**

- Franck Le, **Mudhakar Srivatsa**, Raghu Ganti and Vyas Sekar. Rethinking Data-driven Networking with Foundation Models: Challenges and Opportunities. In HotNets, 2022.
- **Mudhakar Srivatsa**, Raghu Ganti, Linsong Chu, Martin Christiansson, Sofia Rydell and Billy Josefson. Towards AI-based Air Traffic Control. In Air Traffic Management (ATM), Sep 2021.
- **Mudhakar Srivatsa**, Diane Felmlee, Roger Whitaker, Supriyo Chakraborty, and Cheryl Giammanco. Modeling Spread of Curse Words on a Social Network. In Social Network Analytics (NASN), Jan 2021.
- Cai Davies, James Ashford, Luis Espinosa-Anke, Diane Felmlee, Alun Preece, **Mudhakar Srivatsa**, Liam Turner and Roger Whitaker. Multi-Scale User Migration on Reddit. In Intl Workshop on Cyber Social Threats (CySoc), Jun 2021.
- Franck Le and Mudhakar Srivatsa. Discovering Unknown IoT Devices. In IJCAI Workshop on AI for Internet of Things, Jan 2021
- Ziyao Zhang, Liang Ma, Kin K. Leung, Konstantinos Poularakis, and **Mudhakar Srivatsa**. State Action Separable Reinforcement Learning. In IEEE BigData, Dec 2020
- Wei-han Lee, Steve Millman, Nirmal Desai, **Mudhakar Srivatsa** and Changchang Liu. NeuralFP: Out-of-distribution Detection using Fingerprints of Neural Networks. In IEEE Intl Conference on Pattern Recognition (ICPR), Nov 2020
- Franck Le and **Mudhakar Srivatsa**. Deriving Interpretable for IoT Discovery using Attention. In Intl Conference on IoT (ICIOT), Sep 2020
- Oytun Ulutan, Swati Rallapalli, **Mudhakar Srivatsa**, Carlos Torres and BS Manjunath. Actor Conditioned Attention Maps for Video Action Detection. In IEEE Winter Conference on Applications of Computer Vision (WACV), Mar 2020
- Conor Kelton, Aruna Balasubramanian, Ramya Raghavendra and **Mudhakar Srivatsa**. Browser-Based Deep Behavioral Detection of Web Cryptomining with CoinSpy. In Workshop on Measurements, Attacks, and Defenses for the Web (MADWeb), Feb 2020.
- Swati Rallapalli, Liang Ma, **Mudhakar Srivatsa**, Ananthram Swami, Heesung Kwong, Graham Bent, and Christopher Simpkin. SENSE: Semantically Enhanced Node Sequence Embedding. In IEEE Intl Conference on Big Data (BigData), Dec 2019.
- Franck Le, **Mudhakar Srivatsa**, Krishna Kesari Reddy and Kaushik Roy. Using Graphical Models as Explanations in Deep Neural Networks. In 16th IEEE International Conference on Mobile Ad-Hoc and Smart Systems (MASS), Nov 2019.
- Franck Le, **Mudhakar Srivatsa**, and Dinesh Verma. Unearthing and Exploiting Latent Semantics behind DNS Domains for Deep Network Traffic Analysis. In AI4IoT, July 2019.
- Linsong Chu, Ramya Raghavendra, **Mudhakar Srivatsa**, Alun Preece and Daniel Harborne. Feature Importance Identification through Bottleneck Reconstruction. In Intl Conference on Cognitive Computing, July 2019.
- Pranita Dewan, Raghu Ganti, **Mudhakar Srivatsa**, Sebastian Stein. NN-SAR: A Neural Network Approach for Spatial Autoregression. In Information Quality and Quality of Service for Pervasive Computing (IQ2S), Mar 2019.
- Christopher Streiffer, Ramya Raghavendra, Theophilus Benson and **Mudhakar Srivatsa**. Learning to Simplify Distributed Systems Management. In IEEE BigData, Dec 2018.
- Yeon-sup Lim, **Mudhakar Srivatsa**, Supriyo Chakraborty and Ian Taylor. Learning Light-Weight Edge-Deployable Privacy Models. In IEEE BigData, Dec 2018.
- **Mudhakar Srivatsa** et. al. AI Analyst Course Material, IBM Learning Center, Oct 2018.
- Nirmal Desai, Raghu Ganti, Heesung Kwon, Ian Taylor and **Mudhakar Srivatsa**. Unsupervised Estimation of Domain Applicability of Models. In Military Communications (MILCOM), Nov 2018.
- ShreeRanjani SrirangamSridharan, **Mudhakar Srivatsa**, Raghu Ganti and Christopher Simpkin. Doc2Img: A New Approach to Vectorization of Documents. In Fusion, Jul 2018.

- Pranita Dewan, Raghu Ganti and **Mudhakar Srivatsa**. Smart Wildlife. In GEOINT (demo), Mar 2018. <https://www.ibm.com/thought-leadership/smart>, <https://www.youtube.com/watch?v=MSc5I550jIY>
- **Mudhakar Srivatsa** et. al. Securing Personal Information Transmitted on IoT Devices. In Academy of Technology study, Jan 2018.
- Yiran Zhao, Raghu Ganti, **Mudhakar Srivatsa**, and Tarek Abdelzaher. On the Improvement of Classifying EEG Recordings Using Neural Networks. In IEEE BigData, Dec 2017.
- Antara Palit, **Mudhakar Srivatsa**, Raghu Ganti and Christopher Simpkin. Identifying Sensor Accesses from Service Descriptions. In IEEE Big Data International Workshop on Policy-based Autonomic Data Governance (PADG), Dec 2017.
- Christopher Streiffer, Ramya Raghavendra, Theo Benson and **Mudhakar Srivatsa**. DarNet: A Deep Learning Solution for Distracted Driving Detection. In ACM Middleware, Dec 2017.
- Saritha Arunkumar, **Mudhakar Srivatsa** and Elisa Bertino. Learning Information Release Policies for Preventing Intersection Attacks. In IEEE Military Communications Conference (MILCOM), Oct 2017.
- **Mudhakar Srivatsa**, Raghu Ganti and Prasant Mahopatra. On the Limits of Subsampling of Location Traces. In IEEE Intl Conference on Distributed Computing Systems (ICDCS), Jun 2017.
- Pranita Dewan, Raghu Ganti and **Mudhakar Srivatsa**. SOM-TC: Self-organizing map for Hierarchical Trajectory Clustering. In IEEE Intl Conference on Distributed Computing Systems (ICDCS), Jun 2017.
- Shen Li, Raghu Ganti, **Mudhakar Srivatsa** and Tarek Abdelzaher. Stark: Optimizing In-Memory Computing for Dynamic Dataset Collections. In IEEE Intl Conference on Distributed Computing Systems (ICDCS), Jun 2017.
- Archith J. Bency, Swati Rallapalli, Raghu Ganti, **Mudhakar Srivatsa**, and BS Manjunath. Beyond Spatial Auto-Regressive Models: Predicting Housing Prices with Satellite Imagery. In IEEE Conference on Applications of Computer Vision (WACV), Mar 2017.
- Raghu Ganti, **Mudhakar Srivatsa**, Dakshi Agrawal, Petros Zerfos, and Jorge Ortiz. MP-trie: Fast Spatial Queries on Moving Objects. In ACM Middleware, Dec 2016.
- Ramya Raghavendra, Pranita Dewan, and **Mudhakar Srivatsa**. Unifying HDFS and GPFS: Enabling Analytics on Software-Defined Storage. In ACM Middleware, Dec 2016.
- Liang Ma, **Mudhakar Srivatsa**, Derya Cansever, Xifeng Yan, Michelle Vanni and Sue Kase. Decentralized Search in Expert Networks: Generic Models and Performance Bounds. In Intl Conference on Network Protocols (ICNP), Nov 2016.
- Yu Su, Huan Sun, Brian Sadler, **Mudhakar Srivatsa**, Izzeddin Gur, Zenghui Yan and Xifeng Yan. On Generating Characteristic-rich Question Sets for QA. In Intl Conference on Empirical Methods in Natural Language Processing (EMNLP), Nov 2016.
- Semih Yavuz, Izzeddin Gur, Yu Su, **Mudhakar Srivatsa** and Xifeng Yan. Improving Semantic Parsing via Answer Type Inference. In Intl Conference on Empirical Methods in Natural Language Processing (EMNLP), Nov 2016.
- Saritha Arunkumar, **Mudhakar Srivatsa**, Berker Soylooglu, Murat Sensoy and Federico Cerutti. Privacy Enforcement Through Policy Extension. In Military Communications (MILCOM), Nov 2016.
- Liang Ma, **Mudhakar Srivatsa**, Xifeng Yan, Derya Cansever, Sue Kase and Michelle Vanni. Query Answering Efficiency in Expert Networks under Decentralized Search. In Intl Conference on Information and Knowledge Management (CIKM), Oct 2016.
- Liang Ma, **Mudhakar Srivatsa**, Derya Cansever, Xifeng Yan, Sue Kase, and Michelle Vanni. On the Efficiency of Decentralized Search in Expert Networks. In IEEE Intl Conference on Distributed Computing Systems (ICDCS), June 2016 (short paper)
- Palanivel Kodeswaran, Ravindranath Kokku, Sayandeep Sen and **Mudhakar Srivatsa**. Idea: A System for Efficient Failure Management in Smart Home IoT environments. In Intl Conference on Mobile Systems, Applications and Services (MobiSys), June 2016.

- Roger Moussalli, **Mudhakar Srivatsa** and Sameh Asaad. Spatial Predicates Evaluation in the Geohash Domain Using Reconfigurable Hardware. In IEEE Intl Symposium on Field-Programmable Custom Computing Machines (FCCM), May 2016.
- Fangqiu Han, Shulong Tan, Huan Sun, **Mudhakar Srivatsa**, Deng Cai, and Xifeng Yan. Distributed Representations of Expertise. In SIAM International Conference on Data Mining (SDM), May 2016.
- Raghu Ganti, **Mudhakar Srivatsa** and BS Manjunath. Entity Reconciliation in a Multi-camera Network Using Spatiotemporal Analysis. In Intl Conference on Understanding Situations Through Multimodal Sensing (uSitu), Jan 2016.
- Eva Lilly, Jeff Jonas, **Mudhakar Srivatsa**, Raghu Ganti, Dakshi Agrawal, Larry Denneau, M. Kratky and R.J. Wainscoat. Predicting close encounters between asteroids with the STB software. In American Astronomical Society Division of Planetary Sciences Meeting (AAS DPS), Nov 2015.
 - * On context computing, irresistible surveillance, and hunting asteroids with Space Time Boxes. <https://www.oreilly.com/ideas/jeff-jonas-on-context-computing-irresistible-surveillance-and-hunting-asteroids-with-space-time-boxes-2>
 - * Big Data. New Physics. And Geospatial Superfood. <https://ecc.marist.edu/documents/367507/568146/JonasBig-Marist-+-+June+2016.pdf/2143be92-b274-46c5-8662-a49354f1a0d5>
- Saritha Arunkumar, **Mudhakar Srivatsa**, Murat Sensoy and Muttukrishnan Rajarajan. Global Attenuation of Location in Mobile Devices. In Military Communications (MILCOM), Oct 2015.
- Y. Su, S. Yang, H. Sun, **M. Srivatsa**, S. Kase, M. Vanni, X. Yan. Exploiting Relevance Feedback in Knowledge Graph Search. In ACM Conference on Knowledge Discovery and Data Mining (KDD), Aug 2015.
- Shen Li, Raghu Ganti, **Mudhakar Srivatsa** and Tarek Abdelzaher. Pyro: A Spatiotemporal Big Data Storage System for Dynamic Workload Hotspots. In USENIX Annual Technical Conference (ATC), July 2015.
- M. Khouzani, P. Mardziel, C. Cid and **M. Srivatsa**. Picking v.s. Guessing Secrets: A Game-Theoretic Analysis. In IEEE Computer Security Foundations Symposium (CSF), July 2015.
- Md Tanvir Al Amin, Shen Li, Muntasir Raihan Rahman, Panindra Tumkur Seetharamu, Shiguang Wang, Tarek Abdelzaher, Indranil Gupta, **Mudhakar Srivatsa**, Raghu Ganti, Reaz Ahmed and Hieu Le. SocialTrove: A Self-summarizing Storage Service for Social Sensing. In IEEE Intl Conference on Autonomic Computing (ICAC), July 2015 (**best paper award**).
- Roger Moussalli, **Mudhakar Srivatsa** and Sameh Asaad. Fast and Flexible Conversion of Geohash Codes to and from Latitude/Longitude Coordinates. In IEEE Intl Symposium on Field-Programmable Custom Computing Machines (FCCM), May 2015.
- Saritha Arunkumar, **Mudhakar Srivatsa**, Murat Sensoy, and Muthukrishnan Rajarajan. Enforcing Location-based Access Control Policies, TENSYP, May 2015.
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- **Mudhakar Srivatsa**. Who is Listening? Security in Wireless Networks. IEEE International Conference on Signal Processing, Communications and Networking (ICSCN), Jan 2008 (**invited paper**).
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- **Mudhakar Srivatsa** and Ling Liu. Key Derivation Algorithms for Monotone Access Structures in Cryptographic File Systems. 11th European Symposium on Research in Computer Security (ESORICS), Sep 2006 (AR: 17%).
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- **Mudhakar Srivatsa**, Li Xiong and Ling Liu. TrustGuard: A Dependable Reputation Management for Large Scale Distributed Systems. 14th World Wide Web Conference (WWW), May 2005 (AR: 14%).
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- **Mudhakar Srivatsa**, Bugra Gedik and Ling Liu. Improving Peer-to-Peer Search Using Multi-Tier Capability-Aware Overlay Topologies. 10th IEEE International Conference on Parallel and Distributed Systems (ICPADS), Jul 2004 (AR: 28%).

• Refereed Workshop Publications

- Conor Kelton, Aruna Balasubramanian, Ramya Raghavendra and **Mudhakar Srivatsa**. Browser-based Deep Behavioral Detection of Web Cryptomining with CoinSpy. In MADWeb, Mar 2020.
- Joshua Rosenkranz, **Mudhakar Srivatsa** and Supriyo Chakraborty. Cognitive IoT Applications at the Edge. In InterConnect, Mar 2017.
- Sayandeep Sen, Palani Kodeswaran and **Mudhakar Srivatsa**. Robust Activity Detection from Sensor Streams. In Consumer Electronics Show (CES), June 2015.
- **Mudhakar Srivatsa**. Accumulating Context over Streaming Spatiotemporal Data. In Contextual Computing Workshop, Feb 2013.
- Dakshi Agrawal, Raghu Ganti, **Mudhakar Srivatsa** and Petros Zerfos. Spatio-temporal Analytics for User Demographics and Route Avoidance. Information on Demand (IoD) demo, Oct 2012.
- Achille Fokoue and **Mudhakar Srivatsa**. Trust-based Decision-Making with Uncertain Information. Discrete Mathematics and Theoretical Computer Science Workshop on Adversarial Decision Making, Sep 2010.
- **Mudhakar Srivatsa**, Pankaj Rohatgi, Shane Balfe and Steffen Reidt. Securing Information Flows: A Metadata Model. 1st IEEE Workshop on Quality of Information (QoI) for Sensor Networks (QoISN), Sep 2008.
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- Aameek Singh, **Mudhakar Srivatsa**, Ling Liu and Todd Miller. Apoidea: A Decentralized Peer-to-Peer Architecture for Crawling the World Wide Web. 26th ACM Distributed Information Retrieval workshop (SIGIR), Aug 2003. An extended version appears in Lecture Notes of Computer Science (LNCS) Series, Springer Verlag.
- **Mudhakar Srivatsa**, Nithya Rajamani, Daniel M. Dias, Avraham Leff, James T. Rayfield and Peng Ye. A Multi-Site Transactional Grid. IBM Technical EXPO Poster (with Demo) and IBM Research Report, Aug 2003.

• Blogs

- Advanced AI/ML Accelerators for 5G and Edge Computing use cases
- Coreset: Intelligent Data Sampling for AI/ML at the 5G Edge
- Federated Learning: Learn on Private and Partitioned Datasets

- **Patents**

- Granted: 72; Pending: 20 (<http://www.uspto.gov/>)