

**ZORAN KOSTIĆ, Ph.D. Curriculum Vitae**[zk2172\(AT\)columbia.edu](mailto:zk2172(AT)columbia.edu)**Professor of Professional Practice, MS EE Program Director.****Electrical Engineering Department, Columbia University in the City of New York.**<https://www.aidl.ee.columbia.edu/>**SUMMARY****Academic and industrial research, intellectual property and product development expertise.**

Current research on applications of AI Deep Learning in smart cities, medical/healthcare fields, heterogeneous edge computing, and Internet of Things. Real-time, low power, low-complexity systems. Edge inference. Expertise in signal processing, digital communications, mobile and wireless systems and networks, and system-on-chip design. Theoretical and applied research, teaching, notable publication and IP development record. Leadership roles in the industrial development of software and application-specific VLSI. IEEE Transactions editor, experience with NSF/NIH projects, intellectual property consulting, and fundraising.

**EDUCATION****Ph.D. in Electrical Engineering, Signal Processing and Communications** - July '91

University of Rochester, Rochester, New York.

**M.S. in Electrical Engineering, Communications and Signal Processing** - October 1988, University of Rochester, Rochester, NY.**Dipl. Ing. - Telecommunications and Electronics** - May 1987; Faculty of Technical Sciences, University of Novi Sad, Novi Sad, Yugoslavia.**ACADEMIC RESEARCH****Using automated speech processing to improve identification of risk for hospitalizations and emergency department visits in home healthcare**

Funded by NIH

**Precision plastic waste cleanup and monitoring: AI-enhanced solution for sustainable waterways and ocean health**

Funded by the NOAA New York Sea Grant

**Smart City Intersections: Intelligence Nodes for Future Metropolises**

Funded by the NSF Engineering Research Center for Smart Streetscapes (CS3)

**Hybrid Twins for Urban Transportation: From Intersections to Citywide Management.**

Funded by the NSF Cyber Physical Program.

**Using speech and language to identify patients at risk for hospitalizations and emergency department visits in homecare.**

Columbia Center of Artificial Intelligence Technology, Funded by Amazon.

<https://cait.engineering.columbia.edu/>**CIRC: COSMOS Advanced Wireless Research Testbed**

Research on AI applications for smart cities.

<https://www.cosmos-lab.org/experimentation/smart-city-intersections/>

Funded by the NSF PAWR program.

### **COSMOS and EFRI NewLAW – Wireless communications**

Summer Research Program for Teachers.

Research Experiences for Teachers. NSF REM and NSF RET

CURRENT: Key contributor to the NSF REM (Research Experience and Mentoring) supplement for funding 12-15 teachers under the grant Program NSF EFRI grant awarded to Prof. Harish Krishnaswamy. EFRI NewLAW: Novel Approaches to RF Non-Reciprocity in Semiconductor.

<https://www.cosmos-lab.org/outreach/>

### **Detection and Tracking of Peripheral Edema.**

AI-based methods and system for real-time tracking of peripheral edema.

### **Real-Time Robotic Surgery Applications**

AI applications for improving efficiencies in robot-assisted surgeries.

## **ACADEMIC EXPERIENCE**

**Columbia University, Electrical Engineering Dept., Professor of Prof. Practice**, New York City, 2020 - now. Neural Networks and Deep Learning, Smart Cities, Internet of Things, Heterogeneous Computing, Applications of Deep Learning. Director of the MS EE program.

**Columbia University, Electrical Engineering Dept., Associate Professor of Prof. Practice**, New York City, 2014-2019.

**Columbia University, Electrical Engineering Department – Adjunct Professor**, New York City, 2012-2013. Digital Communications, Wireless Communications.

**Columbia University, Electrical Engineering Department – Adjunct Assistant Professor**, New York City, Spring 1994. Taught graduate level course on Communications Theory.

**University of California at Los Angeles – Instructor** for 12 short courses, "Wireless CDMA and IS-95 Digital Cellular Communications" and "Digital Signal Processing in Wireless Communications".

**University of California at San Diego – Instructor** for 2 short courses, "Digital Cellular Communications"

**CEI Europe – Instructor for a short course**, "Implementation Aspects of Third Generation Digital Cellular Systems".

## **INDUSTRIAL RESEARCH AND DEVELOPMENT EXPERIENCE**

**Broadcom Corporation – Mobile Systems Architecture, Senior Principal Scientist**, New Jersey, San Diego, Irvine. 2006-2014.

Lead system architect - development of mobile system-on-chip (SoC) devices: low-power multi-functional communications/multimedia chips with tightly integrated cellular, WLAN, GPS, near-field communication and multimedia co-processors. Technical areas covered: architectural design; algorithms, software/firmware on general purpose ARM processors, design of VLSI-based SIMD graphics accelerator. Partitioning and low-power implementation across software, ASICs and hardware. Research on parallel programmable architectures for high bandwidth wireless and multimedia systems. Customization of multi-core, multi-cluster ARM processor architectures.

Program Management role: Managing technical aspects of the cross-functional teams, with focus on multimedia performance, memory bandwidth and power consumption.

**The MathWorks – Communications Division – Principal Engineer**, Natick, MA, 2004-2006.

Research on architectures and methodologies for model-based communications system development and signal processing applications design. Development of methods, software and tools for

automated conversion of algorithms into efficient DSP/VLSI implementations. Development of model-based software defined radio in support of research programs in industry and academia. Reusable code generation for wireless systems. Low density parity check coding for DVB-S.2. Fixed-point analysis. Synchronization and packet communications for advanced wireless systems. Consulting for wireless communications industry - Samsung, Qualcomm, Nokia, BAE, Harris.

**Thomson Corporate Research - Principal Member of Research Staff**, Princeton, NJ, 2002 - 2004.

Multicast-Broadcast Multimedia Services in mobile communication systems. Architecture of cellular infrastructure optimized for delivery of high data rate video by means of streaming and opportunistic download: caching, video coding resiliency tools, utilization of feedback. Location based service enhancements for mobile communications All-IP network design for cellular and mobile communications. Packet channel use for statistical multiplexing of video content. UMTS terminal evolution for support of H264/JVT high bit rate video codecs. WCDMA terminal transceiver ASIC development in System-C environment: C to RTL.

**AT&T Laboratories Research -Wireless Research - Principal Member of Research Staff**,

Red Bank and Middletown, NJ, USA, 1997-2002.

Radio Resource Management and QoS for Wireless LANs. Simulcasting and multicasting in OFDM wireless systems. Capacity and performance of mixed voice/data cellular systems based on code-division multiple-access (UMTS-WCDMA with DSH). TCP-aware radio link protocols for wireless communications. Interactions between TCP/IP protocols and lower layers in future cellular systems. OFDM-integrated frequency hopping. Micro/macro cellular systems in single carrier deployments. Dynamic frequency hopping for spectral efficiency improvements in 3G cellular systems. Maximal ratio combining for finger-limited RAKE combining (selective RAKE receivers).

**Bell Laboratories, Wireless Systems Research Department - Senior Member of Research Staff**,

Holmdel, NJ, USA, 1995-1997.

Diversity, modulation and synchronization for packet data evolution of TDMA systems.

Real-time custom HW/SW base-station and mobile transceiver design and implementation for data evolution for the TDMA American digital cellular system -based on digital receiver architecture, quad-boards TI DSP boards, custom RF.

Experimental studies of enhanced IS-136 performance - diversity demonstration with minimally spaced antennas.

**AT&T Bell Laboratories, Advanced Wireless Terminals Division - Member of Technical Staff and Project Leader**, Holmdel, NJ '91-95.

Advanced Digital Cellular Terminal Development: Analysis, algorithm, system and DSP/ASIC Design Lead.

IS-95 CDMA mobile transceiver and low-power chipset design: Algorithms and fixed point DSP code for synchronization and RAKE receiver control. Algorithms and VLSI design for RAKE receiver. Synchronization, timing, demodulation algorithms. Design of the DSP kernel, interfaces to ASIC and uC, task scheduling. System specification, timing analysis, functional partitioning into uC, DSP and ASIC. Experimental work on DSP/FPGA and DSP/ASIC platforms.

IS-136 TDMA Algorithm design: Low complexity POCS-based equalizer for IS-136: analysis, simulation and fixed point implementation. SW transceiver architecture.

High resolution channel estimation using the method of projection onto convex sets.

Interference minimization in packet-based CDMA systems.

**University of Rochester, Electrical Engineering Department – Research and Teaching Assistant** in Communications and Signal Processing, Rochester, NY, 1987-1991.

- Coding techniques for CDMA in frequency-hopping, time-hopping and optical communication

channels. New codes that enable the computation of exact probability distribution functions representing interference

- Developed a technique for high resolution estimation of specular multipath channels based on the set-theoretic deconvolution, with applications to wideband systems with RAKE receivers.
- Research on time-frequency signal representation and channel measurement for radar and sonar channels

## MENTORING

### **Mentoring research at Columbia University:**

MS students, PhD students, Postdoctoral Associates, Senior Scientists.

### **Mentoring research at Columbia University – topics**

Real time inference, edge AI, low power, low compute.

AI applications for plastics in environmental studies

AI applications for speech analysis in medicine and healthcare applications

Hybrid digital twins for smart cities

COSMOS advanced wireless research platform.

Smart city intersections - cloud connected vehicle monitoring and control, real time AI inference.

Deep learning applications for peripheral edema measurement and monitoring.

Internet of Things – Smart city applications, Indoor Localization.

Modeling of latency distributions in LTE networks.

Internet of Things Data Analytics.

### **Co-supervised research of Ph.D. level internship students, as a mentor from industry:**

Rutgers University - Multipath Estimation based on POCS.

Columbia University - Synchronization in TDMA systems.

Rutgers University - Dynamic Frequency Hopping.

Princeton University - Theory of Dynamic Frequency Hopping in OFDM.

Princeton University - Applications of Information Theory in wireless systems.

## TECHNICAL SKILLS

### **Software and Hardware Experience**

Programming Languages and Frameworks: Tensorflow, PyTorch, JAVA, Python, C, C++, System-C, Fortran, DSP16xx & TI DSP Assemblers, Pascal, Z-80 Assembly, DBaseII+.

Operating System: Linux, Unix, Windows, DOS, VMS, CMS.

Computers: SUN, PC, VAX, IBM, Honeywell, Alliant.

Software Packages: Matlab/Simulink, SPW, IMSL, DISSPLA, IEEE DSP, Mathematica, Synopsis.

Real Time Development Platforms: TI and Lucent floating and fixed point DSPs, Xilinx-Aptex FPGA boards, Pentek, custom designed ASIC/DSP boards, logic analyzers.

Automation tools for model-based communications system design: derivatives of Simulink, component based design.

## STANDARDS

Contributed to IETF header compression and IEEE 802.11h standards. Involved in 3GPP standardization process and 802.11 standards. Khronos OpenXX standardization, MIPI interface standards.

## MEMBERSHIPS, AWARDS AND ACTIVITIES

US National Science Foundation - participant in grant proposal evaluation for information technologies area - wireless. Large grant evaluation.

IEEE Transactions on Communications - Editor Emeritus for Wireless Systems.

IEEE Communications Letters, Editor Emeritus.

IEEE JSAC, IEEE Wireless transactions, Signal Processing, Vehicular Technologies, other archival journals - reviewer.

IEEE Senior Member.

Organizer and chairman for more than two dozen conference sessions: ICC, Globecom, PIMRC, other. Workshop Chair, "Internet of Things - Physical Data Analytics," IEEE Secon 2016.

Broadband wireless - Symposium Chair for ICC2003.

Panelist on dozen sessions on wireless and software defined radio.

Merit fellowship recipient, University of Novi Sad (1983-1986); Honorary Awards for Academic Excellence, University of Novi Sad, ('84,'85,'86).

Amateur radio operator, KF2KB; Amateur glider pilot.

## PROJECTS

2025-2029 NSF CNS "CIRC: GRAND/ENS: COSMOS3: Enhancing and Sustaining the COSMOS Platform", Co-PI, US\$ 3,365,448.00, ID 2450567.

2024-2027 National Oceanic and Atmospheric Administration grant NOAA NA24OARX417C0407-T1-01, "NOAA: NEW YORK SEA GRANT Precision plastic waste cleanup and monitoring: AI-enhanced solution for sustainable waterways and ocean health", Co-PI.

2023-2027 NIH R01 Grant R01AG081928, "Using automated speech processing to improve identification of risk for hospitalizations and emergency department visits in home healthcare". Co-PI.

2023-2028 NSF grant, "NSF Engineering Research Center for Smart Streetscapes" – Situational Awareness and Streetscape Applications, Co-PI.

2021 -2024: NSF grant, "CPS: Medium: Hybrid Twins for Urban Transportation: From Intersections to Citywide," NSF Cyber-Physical systems grant, \$210,000, Co-PI.

2022 Summer: NSF grant, "NSF Research Education for Teachers (RET) for COSMOS, and NSF Research Experience and Mentoring EFRI NewLAW," \$100,000, Co-PI, program execution.

2021 Summer: NSF grant, "NSF Research Education for Teachers (RET) for COSMOS, and NSF Research Experience and Mentoring EFRI NewLAW," \$100,000, Co-PI, program execution.

2021: Amazon/Columbia Center of AI Technology (CAIT) grant, "Using speech and language to identify patients at risk for hospitalizations and emergency department visits in homecare," Amazon sponsored research award related to the Columbia Center of AI Technology, \$100K,  
<https://cait.engineering.columbia.edu/>.

2018-2023: NSF Grant, "COSMOS: Cloud Enhanced Open Software Defined Mobile Wireless Testbed for City-Scale Deployment", NSF/PAWR grant, \$22.5 Million, Co-PI.

2020 Summer: NSF Grant, "NSF Research Education for Teachers (RET) for COSMOS, and NSF Research Experience and Mentoring EFRI NewLAW," \$100,000, Co-PI, program execution.

2019: Industrial Grant," Verizon 5G EdTech - 5G COVET (5G COSMOS Verizon Education Toolkit) Challenge, \$100,000.

2019 Summer: NSF Grant, "NSF Research Education for Teachers (RET) for COSMOS, and NSF Research Experience and Mentoring EFRI NewLAW," \$100,000, Co-PI, program execution.

2018 Summer: NSF Grant, “NSF Research Education for Teachers (RET) for COSMOS,” \$100,000, Co-PI, program execution

2018-2019: HFSA Grant, “Deep Learning for Phenotyping of Peripheral Edema,” HFSA Nursing Mini Grant, \$5,000, PI.

2017-2018: Columbia CaMPR grant, “Elucidating complexity and characterizing phenotypes of peripheral edema”, Phase I Grant: Collaborative and Multidisciplinary Pilot Research (CaMPR) Award, Columbia Irving Institute for Clinical and Translational Research, \$15,000, Co-PI.

2003-2004: Participated in writing proposal and raising money for research programs for collaboration between Thomson Corporate Research and sponsored universities.

2001-2002: Startup Funding, Innovics Inc, One of the two authors of the proposal which obtained US\$3.5 million funding for research and implementation of reconfigurable wireless processors. Co-owner, technical advisory board of the startup which developed multi-antenna, diversity-enabled WCDMA-3G mobile terminal ASIC.

## PATENTS

Three dozen US and international patents granted or in process.

<https://patents.justia.com/inventor/zoran-kostic>

Selected patents:

- Combined simulcasting and dedicated services in a wireless communication system.
- Method and apparatus for implementing measurement based dynamic frequency hopping in wireless communication systems.
- TDMA communication system having enhanced power control.
- Dynamic frequency hopping.
- Technique for minimizing the variance of interference in packetized interference-limited wireless communication systems.
- CDMA rake receiver with sub-chip resolution.
- Equalization technique for compensating for degradation to the transmission of digitally modulated signals.
- Combined simulcasting and dedicated services in a wireless communication system.
- TDMA communication system having enhanced power control.
- Adaptive MAC fragmentation and rate selection for 802.11 wireless networks.
- WLAN having load balancing based on access point loading.
- WLAN having load balancing by access point admission/termination.
- Packet shaping for mixed rate 802.11 wireless networks.
- Method and apparatus for implementing measurement based dynamic frequency hopping in wireless communication systems.
- Combined simulcasting and dedicated services in a wireless communication system.

## PEER-REVIEWED PUBLICATIONS

M. K. Turkcan, L. McHugh, X. Chen, M. Ballo, A. A. Godbole, M. C. Morais, Z. Kostic, and F. Filicori, "Instrument Kinematics Reconstruction in Tele-Operated Robotic Surgery: A Modular Pipeline for



- Behavioral Analytics," in *Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) Workshops (WACVW)*, Mar. 2026. [Online]. Available: [https://openaccess.thecvf.com/WACV2026\\_workshops/P2P](https://openaccess.thecvf.com/WACV2026_workshops/P2P)
- Y. Fu, M. K. Turkcan, M. Ghasemi, Z. Mo, C. Zang, A. Adhikari, Z. Kostic, G. Zussman, and X. Di, "AI-Powered CPS-Enabled Vulnerable-User-Aware Urban Transportation Digital Twin: Methods and Applications," *IEEE Transactions on Intelligent Transportation Systems*, vol. PP, pp. 1–18, Jan. 2026. doi: 10.1109/TITS.2026.15249050.
- J. Tavori, M. K. Turkcan, Z. Kostic, J. Ghaderi, and G. Zussman, "Worst-Case Attacks in Reactive Edge-Cloud Systems: Expected Latency and SLA Violation," in *Proceedings of the 10th ACM/IEEE Symposium on Edge Computing (SEC '25)*, Dec. 2025, pp. 248–262. doi: 10.1145/3769102.3770627.
- Y.-W. Chen, W. Ho, S. M. Vergez, G. Flaherty, P. Gupta, Z. Zhang, M. Zolnoori, M. V. McDonald, M. Topaz, Z. Kostic, and J. Hirschberg, "Hearing Health in Home Healthcare: Leveraging LLMs for Illness Scoring and ALMs for Vocal Biomarker Extraction," in *The Second Workshop on GenAI for Health: Potential, Trust, and Policy Compliance (GenAI4Health) at NeurIPS 2025*, Dec. 2025.
- C. Zang, M. K. Turkcan, G. Zussman, Z. Kostic, and J. Ghaderi, "Adaptive Data Collection for Robust Learning Across Multiple Distributions," in *Proceedings of the 42nd International Conference on Machine Learning*, ser. *Proceedings of Machine Learning Research*, vol. 267, A. Singh *et al.*, Eds. PMLR, Jul. 2025, pp. 73974–73994. [Online]. Available: <https://proceedings.mlr.press/v267/zang25a.html>
- S. Narasimhan, M. K. Turkcan, M. Ballo, S. Choksi, F. Filicori, and Z. Kostic, "Monocular 3D Tooltip Tracking in Robotic Surgery—Building a Multi-Stage Pipeline," *Electronics*, vol. 14, no. 10, Art. no. 2075, May 2025. doi: 10.3390/electronics14102075.
- M. Ghasemi, Y. Fu, X. Ouyang, P. Wang, M. K. Turkcan, J. Tavori, S. Kleisarchaki, T. Calmant, L. Gürgen, Z. Kostic, X. S. Di, G. Zussman, and J. Ghaderi, "Real-Time Video Analytics for Urban Safety: Deployment over Edge and End Devices," in *Proceedings of the 10th ACM/IEEE Symposium on Edge Computing (SEC '25)*, Dec. 2025, pp. 104–120. doi: 10.1145/3769102.3770618. Best Paper Award
- Choksi, Sarah & Narasimhan, Sanjeev & Ballo, Mattia & Turkcan, Mehmet & Hu, Yiran & Zang, Chengbo & Farrell, Alex & King, Brianna & Nussbaum, Jeffrey & Reisner, Adin & Kostic, Zoran & Taffurelli, Giovanni & Filicori, Filippo, "Automatic assessment of robotic suturing utilizing computer vision in a dry-lab simulation," *Artificial Intelligence Surgery*, 2025, 5. 160-9. 10.20517/ais.2024.84.
- Y. Li, D. Gumaste, M. K. Turkcan, [J. Ghaderi](#), G. Zussman, and Z. Kostic, "Distributed VLMs: Efficient Vision-Language Processing through Cloud-Edge Collaboration," in *2025 IEEE International Conference on Pervasive Computing and Communications Workshops (PerCom Workshops)*, Mar. 2025, pp. 280–286. doi: 10.1109/PerComWorkshops65533.2025.00078.
- N. Mitra, S. Narasimhan, M. K. Turkcan, Z. Kostic, Y.-R. Chen, S. Choksi, E. Nilsson-Sjolander, P. Palacios, K. Carsky, A. Riaz, F. Filicori, and R. L. Whelan, "Computer vision scoring of endoscopically traced line figures in an inanimate scope tip coordination training model," *Surgical Endoscopy*, vol. 38, no. 12, pp. 7414–7422, Dec. 2024. doi: 10.1007/s00464-024-11306-6.
- G. Jain, B. Hindi, Z. Zhang, K. Srinivasula, M. Xie, M. Ghasemi, D. Weiner, S. A. Paris, X. Y. T. Xu, M. Malcolm, M. K. Turkcan, J. Ghaderi, Z. Kostic, G. Zussman, and B. A. Smith, "StreetNav: Leveraging Street Cameras to Support Precise Outdoor Navigation for Blind Pedestrians," in *Proceedings of the 37th Annual ACM Symposium on User Interface Software and Technology (UIST '24)*, Oct. 2024, Art. no. 139, pp. 1–21.

doi: 10.1145/3654777.3676333.

Y. Fu, M. K. Turkcan, V. Anantha, Z. Kostic, G. Zussman and X. Di, "Digital Twin for Pedestrian Safety Warning at a Single Urban Traffic Intersection," *2024 IEEE Intelligent Vehicles Symposium (IV)*, Jeju Island, Korea, Republic of, 2024, pp. 2640-2645, doi: 10.1109/IV55156.2024.10588544.

Mahshid Ghasemi, Zoran Kostic, Javad Ghaderi, and Gil Zussman," EdgeCloudAI: Edge-Cloud Distributed Video Analytics,". *In Proceedings of the 30th Annual International Conference on Mobile Computing and Networking (ACM MobiCom '24)*. Association for Computing Machinery 2024, New York, NY, USA, 1778–1780. <https://doi.org/10.1145/3636534.3698857>

Ghasemi, Mahshid; Yang, Zhengye; Yang, Mingfei; Sun, Hongzhe; Ye, Zihao; Ghaderi, Javad; Kostic, Zoran; Zussman, Gil, "Video-Based Social Distancing: Evaluation in the COSMOS Testbed," in *IEEE Internet of Things Journal*, vol. 11, no. 3, pp. 4987-4997, 1 Feb.1, 2024, doi: 10.1109/JIOT.2023.3305587.

Zolnoori, M., Sridharan, S., Zolnour, A., Vergez, S., McDonald, M. V., Kostic, Z., Bowles, K. H., & Topaz, M. (2024). Utilizing patient-nurse verbal communication in building risk identification models: the missing critical data stream in home healthcare. *Journal of the American Medical Informatics Association : JAMIA*, 31(2), 435–444. <https://doi.org/10.1093/jamia/ocad195>.

Choksi, S., Szot, S., Zang, C., Yarali, K., Cao, Y., Ahmad, F., Xiang, Z., Bitner, D. P., Kostic, Z., & Filicori, F. (2023). Bringing Artificial Intelligence to the operating room: edge computing for real-time surgical phase recognition. *Surgical endoscopy*, 37(11), 8778–8784. <https://doi.org/10.1007/s00464-023-10322-4>

Zolnoori, M., Vergez, S., Sridharan, S., Zolnour, A., Bowles, K., Kostic, Z., & Topaz, M. (2023). Is the patient speaking or the nurse? Automatic speaker type identification in patient-nurse audio recordings. *Journal of the American Medical Informatics Association : JAMIA*, 30(10), 1673–1683. <https://doi.org/10.1093/jamia/ocad139>.

Zang, C., Turkcan, M. K., Narasimhan, S., Cao, Y., Yarali, K., Xiang, Z., Szot, S., Ahmad, F., Choksi, S., Bitner, D. P., Filicori, F., & Kostic, Z. (2023). Surgical Phase Recognition in Inguinal Hernia Repair-AI-Based Confirmatory Baseline and Exploration of Competitive Models. *Bioengineering (Basel, Switzerland)*, 10(6), 654. <https://doi.org/10.3390/bioengineering10060654>

Topaz, M., Zolnoori, M., Norful, A. A., Perrier, A., Kostic, Z., & George, M. (2022). Speech recognition can help evaluate shared decision making and predict medication adherence in primary care setting. *PloS one*, 17(8), e0271884. <https://doi.org/10.1371/journal.pone.0271884>.

Choksi, S., Szot, S., Zang, C., Yarali, K., Cao, Y., Ahmad, F., Xiang, Z., Bitner, D. P., Kostic, Z., & Filicori, F. (2023). Bringing Artificial Intelligence to the operating room: edge computing for real-time surgical phase recognition. *Surgical endoscopy*, 37(11), 8778–8784. <https://doi.org/10.1007/s00464-023-10322-4>.

M. Ghasemi, S. Kleisarchaki, T. Calmant, Jiawei Lu, Shivam Ojha, Z. Kostic, L. G ürgen, J. Ghaderi, and G. Zussman, "Real-time Multi-Camera Analytics for Traffic Information Extraction and Visualization," *2023 IEEE International Conference on Pervasive Computing and Communications Workshops and other Affiliated Events (PerCom Workshops)*, Atlanta, GA, USA, 2023, pp. 288-290, doi: 10.1109/PerComWorkshops56833.2023.10150224.

Zoran Kostić; Alex Angus; Zhengye Yang; Zhuoxu Duan; Ivan Seskar; Gil Zussman; Dipankar Raychaudhuri, "Smart City Intersections: Intelligence Nodes for Future Metropolises," in *Computer*, vol. 55, no. 12, pp. 74-85, Dec. 2022, doi: 10.1109/MC.2022.3206273.



Z. Yang, M. Sun, H. Ye, Z. Xiong, G. Zussman and Z. Kotic, "Bird's-eye View Social Distancing Analysis System," *2022 IEEE International Conference on Communications Workshops (ICC Workshops -2022 Workshop on Edge Learning for 5G Mobile Networks and Beyond)*, Seoul, Korea, Republic of, 2022, pp. 427-432, doi: 10.1109/ICCWorkshops53468.2022.9814627.

A. Angus, Z. Duan, G. Zussman and Z. Kostić, "Real-Time Video Anonymization in Smart City Intersections," *2022 IEEE 19th International Conference on Mobile Ad Hoc and Smart Systems (MASS)*, Denver, CO, USA, 2022, pp. 514-522, doi: 10.1109/MASS56207.2022.00078.

Mahshid Ghasemi, Sofia Kleisarchaki, Thomas Calmant, Levent Gürgen, Javad Ghaderi, Zoran Kotic, and Gil Zussman. 2022. Real-time camera analytics for enhancing traffic intersection safety. In *Proceedings of the 20th Annual International Conference on Mobile Systems, Applications and Services (MobiSys '22)*. Association for Computing Machinery, New York, NY, USA, 630–631. <https://doi.org/10.1145/3498361.3538669>

Topaz M, Zolnoori M, Norful AA, Perrier A, Kotic Z, George M., Speech recognition can help evaluate shared decision making and predict medication adherence in primary care setting," *PLoS One*. 2022 Aug 4;17(8):e0271884. doi: 10.1371/journal.pone.0271884. PMID: 35925922; PMCID: PMC9352008.

Song, J., Zolnoori, M., Scharp, D., Vergez, S., McDonald, M.V., Sridharan, S., Kotic, Z., & Topaz, M. (2022) Do nurses document all discussions of patient problems and nursing interventions in the electronic health record? A pilot study in home healthcare (*Journal of the American Medical Informatics Association (JAMIA) Open*, Volume 5, Issue 2, July 2022, ooac034, DOI: <https://doi.org/10.1093/jamiaopen/ooac034>

Jiyoun Song, Maryam Zolnoori, Danielle Scharp, Sasha Vergez, Margaret V. McDonald, Sridevi Sridharan, Zoran Kotic, Maxim Topaz, "Is Auto-generated Transcript of Patient-Nurse Communication Ready to Use for Identifying the Risk for Hospitalization or Emergency Department Visits in Home Health Care? A Natural Language Processing Pilot Study," *AMIA 2022 Annual Symposium*, Nov. 5-9, 2022, Washington, DC, to appear.

Jiyoun Song, Maryam Zolnoori, Danielle Scharp, Sasha Vergez, Margaret V. McDonald, Sridevi Sridharan, Zoran Kotic, Maxim Topaz, "To what extent are verbal conversations between patients and nurses in home healthcare documented in the electronic health record?", *AMIA 2021 Clinical Informatics Conference*, Houston, TX, May 24-26 2022, to appear.

Zolnoori M, Vergez S, Kotic Z, Jonnalagadda S, V McDonald M, Bowles K, Topaz M, "Audio Recording Patient-Nurse Verbal Communications in Home Health Care Settings: Pilot Feasibility and Usability Study," *JMIR Hum Factors* 2022;9(2):e35325, URL: <https://humanfactors.jmir.org/2022/2/e35325> , DOI: 10.2196/35325.

M. Ghasemi, Z. Kotic, J. Ghaderi, and G. Zussman, "Auto-SDA: Automated Video-based Social Distancing Analyzer," in *Proc. 3rd ACM Workshop on Hot Topics in Video Analytics and Intelligent Edges (HotEdgeVideo'21)*, *MobiCom'21*, Association for Computing Machinery, New York, NY, USA. DOI:<https://doi.org/10.1145/3477083.3480154>.

Zhuoxu Duan, Zhengye Yang, Richard Samoilenko, Dwiref Snehal Oza, Ashvin Jagadeesan, Mingfei Sun, Hongzhe Ye, Zihao Xiong, Gil Zussman, Zoran Kotic, "Smart City Traffic Intersection: Impact of Video Quality and Scene Complexity on Precision and Inference," in *2021 IEEE 19th Int Conf on Smart City*, pp. 1521-1528, Haikou, Hainan, China, 20-22 December, 2021.

M. Ghasemi et al. "Auto-SDA: Automated video-based social distancing analyzer," *ACM SIGMETRICS*

*Performance Evaluation Review*, vol. 49, no. 2, pp. 69–71, Sep. 2021.

Panagiotis Skrimponis, Nikos Makris, Sheila Borges Rajguru, Karen Cheng, Jonatan Ostrometzky, Emily Ford, Zoran Kotic, Gil Zussman, Thanasis Korakis, “COSMOS Educational Toolkit: Using Experimental Wireless Networking to Enhance Middle/High School STEM Education,” *ACM SIGCOMM Computer Communication Review*, Volume 50 Issue 4, October 2020.

D. Raychaudhuri, I. Seskar, G. Zussman, T. Korakis, D. Kilper, T. Chen, J. Kolodziejski, M. Sherman, Z. Kotic, X. Gu, H. Krishnaswamy, S. Maheshwari, P. Skrimponis, and C. Gutterman, “Challenge: COSMOS: A city-scale programmable testbed for experimentation with advanced wireless,” in *Proc. ACM MOBICOM’20*, 2020.

Sheila Ivelisse Borges, Zoran Kotic et. al, "A Teacher Professional Development Program Using Wireless Communications and NGSS to Enhance STEM Teaching & Learning," *ASEE Annual Conference & Exposition*, Montreal, June 21-24, 2020.

Shiyun Yang, Emily Bailey, Zhengye Yang, Jonatan Ostrometzky, Gil Zussman, Ivan Seskar, Zoran Kotic, “COSMOS Smart Intersection: Edge Compute and Communications for Bird’s Eye Object Tracking,” in *Proc. IEEE Percom – SmartEdge 2020, 4th International Workshop on Smart Edge Computing and Networking*, March 23, 2020, Austin, Texas.

Masterson Creber R, Myers A, Goyal P, Kotic Z. Deep Learning Method for Video-Based Data to Classify Peripheral Edema Grades. *Journal of Cardiac Failure*. 2019; 25:S103. doi: 10.1016/j.cardfail.2019.07.295.

T. Mao, W. Zhang, H. He, Y. Lin, V. Kale, A. Stein, Z. Kotic, “AIC2018 Report: Traffic Surveillance Research,” in *Proc. IEEE / CVF CVPR2018, NVIDIA AI CITY CHALLENGE Workshop*, Salt Lake City, June 18, 2018.

J. Chen, T. Mao, Y. Qiu, D. Zhou, R. Masterson Creber, Z. Kotic, “Camera-Based Peripheral Edema Measurement Using Machine Learning,” *Sixth IEEE International Conference on Healthcare Informatics (ICHI 2018)*, June 4– June 7, NYC, 2018.

Kin K. Leung, Martin V. Clark, Bruce McNair, Zoran Kotic, Leonard J. Cimini, Jr., and Jack H. Winters, "Outdoor IEEE 802.11 Cellular Networks: Radio and MAC Design, and Their Performance", *IEEE Transactions on Vehicular Technology*, vol. 56, No. 5, pp. 2673 - 2684, Sep. 2007.

Neelesh Mehta, Zoran Kotic et al., "Orthogonality Factor in WCDMA Downlink," *IEEE Transactions on Wireless Communications*, Vol. 2, No. 6, pp. 1138 - 1149, Nov. 2003.

Zoran Kotic and Nelson Sollenberger, "Dynamic Frequency Hopping in limited bandwidth cellular systems," *IEEE Transactions on Wireless Communications*, vol. 20, No. 1, January 2002.

Zoran Kotic, Xiaodong Wang and Ivana Maric, "Theory of Dynamic Frequency Hopping," *IEEE Journal on Special Areas in Communications - Wireless Systems*, Vol. 19, No. 11, pp. 2254-2266, November 2001.

Moe Win and Zoran Kotic, "Impact of Spreading Bandwidth on Rake Reception in Dense Multipath Environments," *IEEE Journal on Special Areas in Communications*, Vol. 17, No. 10, pp. 1794-1806, Oct.1999.

Moe Win and Zoran Kotic, "Virtual Path Technique for Rake Receiver Analysis," *IEEE Communications Letters*, Vol.3, No. 11, pp. 308-310, Nov. 1999.

Z. Kostic, "TCP/IP in Cellular Systems - Network Performance," submitted to IEEE Transactions.

Kostic and G. Pavlovic, "Resolving Sub-chip Spaced Multipath Components in CDMA Communication Systems," *IEEE Transactions of Vehicular Technologies*, Vol. 48, No. 6, pp. 1803-1808, Nov. 1999.

Z. Kostic, "Low Complexity Equalization for  $\pi/4$  DQPSK Signals Based on the Method of Projection onto Convex Sets," appeared in *IEEE Transactions of Vehicular Technologies*, Vol. 48, No. 6, pp. 1916-1922, Nov. 1999.

Z. Kostic, E. L. Titlebaum and Gordana Pavlovic, "Cyclical Coincidence Arrays: Deriving Exact Expressions for Interference Between Users in CDMA Systems," *European Transactions on Telecommunications*, 1997.

Z. Kostic and S. Seetharaman, "Digital Signal Processors in Wireless Communications," *IEEE Communications Magazine*, Dec. 1997.

Z. Kostic and E. L. Titlebaum, "The Design and Performance Analysis for Several New Classes of Codes for Optical Synchronous CDMA and for Arbitrary-Medium Time-Hopping Synchronous CDMA Communication Systems," *IEEE Transactions on Communications*, Vol. 42, pp. 2608-2618, August 1994.

S. V. Maric, Z. Kostic and E. L. Titlebaum, "A New Family of Code Sequences for Use in Spread Spectrum Fiber-Optic Local Area Networks," *IEEE Transactions on Communications*, Vol. 41, pp. 1217-1222, August 1993.

Z. Kostic, M. I. Sezan and E. L. Titlebaum, "Estimation of the Parameters of a Multipath Channel Using Set-Theoretic Deconvolution," *IEEE Transactions on Communications*, vol. 40, pp. 1006-1011, June 1992.

Z. Kostic and A. Rodriguez, "Embeddable Transceiver Code Generation for SDR Applications by Matlab and Simulink - FM3TR Example," *Forty-Fourth SDR Meeting*, June 20-24, 2005.

Z. Kostic and A. Rodriguez, "SDR-Targeted Design Flow: From Executable Specification to Signal Processing Subsystem Code Generation and SCA-Focused Tool Integration," *Software Defined Radio Technical Conference*, November 14-18, 2005, Anaheim, California.

M. Clark, Zoran Kostic, et al., "Outdoor IEEE 802.11 Cellular Networks: Radio Link Performance," *ICC2002*.

Zoran Kostic, et al., "Performance results for the Downlink Shared Channel in WCDMA," *ICC2002*.

Zoran Kostic, "The Performance of the WWW Traffic due to Interactions Between TCP and RLP Protocols in a Cellular System," *Vehicular Technology Conference VTC'2001 Fall*, Atlantic City, New Jersey, October 2001.

Zoran Kostic, "Interaction between radio link protocols and TCP in cellular systems," *Vehicular Technology Conference VTC'2001 Spring*, Rhodes, Greece, May 2001.

Zoran Kostic et al., "Dynamic Frequency Hopping for Limited-Bandwidth Cellular Systems", *ICCCN 2000*, Las Vegas.

Zoran Kostic et al., "Impact of TCP/IP header compression on the performance of a cellular system," *WCNC 2000*, Chicago.

- Z. Kotic et al., "Dynamic Frequency Hopping in Cellular Systems with Network Assisted Resource Allocation," *VTTC 2000*, Tokyo.
- Z. Kotic and Nelson Sollenberger, "Channel Estimation for IS-136+ Packet Data Communications," *IEEE VTTC'99*.
- Z. Kotic and Ivana Maric, "Dynamic Frequency Hopping in Digital Cellular Systems - Simulation Studies," *IEEE VTTC'99*.
- B. McNair, Z. Kotic et al, "Coherent Modulation for IS-136+," *IEEE VTTC'99*.
- Z. Kotic and Bruce McNair, " Experimental Performance Results of an Indoor Wireless Extension of IS-136 Based on PI/8-8DPSK and Coded Modulation," *1998 Vehicular Technology Conference*.
- Z. Kotic and X. Wang, "Dynamic Frequency Hopping in Cellular Communications," *Globecom 1998*.
- Z. Kotic and Nacem Abbassi, " Effects of Transmitter, Receiver and Channel Impairments on the Performance of the Enhanced IS-136 Digital Cellular System for Transmission of High-Quality Speech," *1997 Vehicular Technology Conference*.
- Z. Kotic, G. Pavlovic and E. Titlebaum, "A Technique for Minimizing the Variance of Interference in Packetized Interference-Limited Wireless Communication Systems," *IEEE Globecom 1996, Communication Theory Mini Conference*, pp. 121-126, London, England, Nov. 1996.
- Z. Kotic and G. Pavlovic, "Resolving Sub-chip Spaced Multipath Components in CDMA Communication Systems," *43rd Vehicular Technology Conference*, Secaucus, New Jersey, May 1993.
- Z. Kotic, "Low Complexity Equalization for  $\pi/4$  DQPSK Signals Based on the Method of Projection onto Convex Sets," *1993 Conference on Information Sciences and Systems*, John Hopkins University, Baltimore, Maryland, March 1993.
- G. Pavlovic and Z. Kotic, "Multiframe Identification of Image and Blur Parameters Using Maximum Likelihood Approach," *1993 Conference on Information Sciences and Systems*, John Hopkins University, Baltimore, Maryland, March 1993.
- Z. Kotic and E. L. Titlebaum, "Computation of Exact Interference and Probability of Error for Several CDMA Communication Systems," *1992 IEEE International Communications Conference*, pp. 652-656, Chicago, Illinois, June 1992.
- Z. Kotic, G. Pavlovic and E. L. Titlebaum, "Cyclical Coincidence Arrays: Derivation of New Properties of Signature Sequences and Interference Computation for Some CDMA Communication Systems," *26th Annual Conference on Information Sciences and Systems*, pp. 1073-1077, Princeton, NJ, March 1992.
- G. Pavlovic and Z. Kotic, "Multiframe Maximum Likelihood Parameter Identification for Image Sequences," *26th Annual Conference on Information Sciences and Systems*, pp. 134-137, Princeton, NJ, March 1992.
- Z. Kotic and E. L. Titlebaum, "New Families of Codes Applicable to Synchronous Fiber-Optics Code-Division Multiple-Access Systems and to Arbitrary Synchronous Time-Hopping Code-Division Multiple-Access Communication Systems," in *Proceedings of the 1991 IEEE International Symposium on Information Theory*, pp. 343, Budapest, Hungary, June 1991.

Z. Kostic, E. L. Titlebaum and S. Maric, "The Design of New Optical Codes and Time-Hopping Patterns for Synchronous Spread-Spectrum Code-Division Multiple-Access Communication Systems," in *Proceedings of the 1991 International Communications Conference*, pp. 585-589, Denver, Colorado, June 1991.

Z. Kostic, M. I. Sezan and E. L. Titlebaum, "Estimation of the Parameters of a Multipath Channel Using Set-Theoretic Deconvolution," in *Proceedings of the 1991 International Conference on Acoustics, Speech and Signal Processing*, pp. 1449-1452, Toronto, May 1991.

S. Maric, Z. Kostic and E. L. Titlebaum, "A New Family of Code Sequences for Use in Spread Spectrum Fiber-Optic Local Area Networks," *International Symposium on Information Theory Applications*, Waikiki, Hawaii, November 1990.

Z. Kostic, E. L. Titlebaum and M. I. Sezan, "The Application of Projection Onto Convex Sets (POCS) to Multipath Channel Estimation," in *Proceedings of the Twenty Eight Annual Allerton Conference on Communications, Control, and Computing*, University of Illinois at Urbana Champaign, October 1990.

Z. Kostic, S. Maric and E. L. Titlebaum, "A New Family of Algebraically Designed Optical Orthogonal Codes," in *Proceedings of the Twenty Eight Annual Allerton Conference on Communications, Control, and Computing*, University of Illinois at Urbana Champaign, October 1990.

Z. Kostic and E. L. Titlebaum, "Codes Based on Quadratic Congruences and Their Implementation in Frequency-Hop Spread-Spectrum Communications," in *Proceedings of the 1990 IEEE International Symposium on Information Theory*, pg. 3, San Diego, Jan. 1990

S. Maric, E. L. Titlebaum and Z. Kostic, "Address Assignment for Multiple-Access Systems Based Upon the Theory of Congruence Equations," in *Proceedings of the IEEE Globecom 1989 conference*, pp. 283-287, Nov. 1989.

## OTHER PUBLICATIONS, TALKS AND PRESENTATIONS

M. K. Turkcan, J. Tavori, J. Ghaderi, G. Zussman, Z. Kostić, and A. W. Smyth, "NYC Congestion Pricing: A Vision-Based Analysis," *arXiv preprint arXiv:2602.03015*, Feb. 2026. doi: 10.48550/arXiv.2602.03015.

B.-W. Kim, D. Seskar, I. Li, H. Chen, R. Harris, C. Prunella, Z. Kostic, N. Frearson, J. Goes, and B. Yan, "Precision Plastic Waste Cleanup and Monitoring: AI-Enhanced Solution for Sustainable Waterways and Ocean Health," presented at the *NYC Microplastics Symposium*, Brooklyn, NY, USA, Feb. 13, 2026.

I. Li, D. Seskar, Z. Kostic, N. Frearson, and B. Yan, "Pcatcher AI — Towards Autonomous Trash Collection Platform on Water Surface," presented at the *NYC Microplastics Symposium*, NYU Tandon School of Engineering, Brooklyn, NY, USA, Feb. 13, 2026.

M. Ghasemi, Y. Fu, X. Ouyang, P. Wang, M. K. Turkcan, J. Tavori, S. Kleisarchaki, T. Calmant, L. Gürgen, Z. Kostic, X. S. Di, G. Zussman, and J. Ghaderi, "Demo: Real-Time Video Analytics for Urban Safety, Deployment over Edge and End Devices," in *Proceedings of the 10th ACM/IEEE Symposium on Edge Computing (SEC '25)*, Dec. 2025, pp. 1–3. doi: 10.1145/3769102.3774387.

M. Zolnoori and Z. Kostic, "Using Speech and Language to Identify Patients at Risk for Hospitalizations and Emergency Department Visits in Homecare," presented at the *CAIT Spring Symposium & Research Showcase*, Columbia University, New York, NY, USA, Apr. 30, 2025.

W. Ho, M. K. Turkcan, G. Zussman, J. Ghaderi, and Z. Kostić, "Evaluating Zero-Shot Image Tagging for Urban Traffic Intersection Scenes," presented at the *Data Science Day 2025*, Columbia University, New York, NY, USA, Apr. 02, 2025.

Y. Li, D. Gumaste, M. K. Turkcan, J. Ghaderi, G. Zussman, and Z. Kostić, "Distributed VLMs: Efficient Vision-Language Processing through Cloud-Edge Collaboration," presented at the *Data Science Day 2025*, Columbia University, New York, NY, USA, Apr. 02, 2025.

C. Zang, M. K. Turkcan, G. Zussman, J. Ghaderi, and Z. Kostić, "Data-Driven Traffic Simulation for an Intersection in a Metropolis," presented at the *Data Science Day 2025*, Columbia University, New York, NY, USA, Apr. 02, 2025.

M. K. Turkcan, J. Tavori, J. Ghaderi, G. Zussman, Z. Kostić, and A. W. Smyth, "A Vision-Based Analysis of Congestion Pricing in New York City," presented at the *Data Science Day 2025*, Columbia University, New York, NY, USA, Apr. 02, 2025.

M. K. Turkcan, J. Tavori, J. Ghaderi, G. Zussman, Z. Kostić, and A. W. Smyth, "NYC Congestion Pricing: A Vision-Based Analysis," presented at the *Columbia AI Summit 2025*, Columbia University, New York, NY, USA, Mar. 04, 2025.

M. K. Turkcan, M. Ballo, F. Filicori, and Z. Kostić, "Towards Suturing World Models: Learning Predictive Models for Robotic Surgical Tasks," *arXiv preprint arXiv:2503.12531*, Mar. 2025. doi: 10.48550/arXiv.2503.12531.

M. K. Turkcan et al., "A Computer Vision Testbed for New York City Street Intersections," presented at the *CVPR 2024 Demos*, Seattle, Jun. 17, 2024.

M. Ghasemi, Z. Kostić, J. Ghaderi, and G. Zussman, "EdgeCloudAI: Edge-Cloud Distributed Video Analytics," in *ACM Demo MobiCom '24*.

M. K. Turkcan et al., "Constellation Dataset: Benchmarking High-Altitude Object Detection for an Urban Intersection," 2024, arXiv. doi: 10.48550/ARXIV.2404.16944.

C. Zang, M. K. Turkcan, G. Zussman, J. Ghaderi, and Z. Kostić, "Data-Driven Traffic Simulation for an Intersection in a Metropolis," in *The First Workshop on Populating Empty Cities – Virtual Humans for Robotics and Autonomous Driving (POETS) at CVPR 2024*, 2024. [Online]. Available: <https://openreview.net/forum?id=4f2HOLWzqu>

W. Ho, M. K. Turkcan, J. Ghaderi, G. Zussman, and Z. Kostić, "Evaluating Zero-Shot Image Tagging for Urban Traffic Intersection Scenes," presented at the *Visual Anomaly and Novelty Detection Workshop at CVPR 2024*, Seattle, Jun. 17, 2024.

C. Zang, M. K. Turkcan, G. Zussman, J. Ghaderi, and Z. Kostić, "Evaluating Trajectory Forecasting Models for a New York City Street Intersection," presented at the *Data Science Day 2024, Columbia University*, New York, Apr. 05, 2024.

Z. Kostić, "Real Time for Urban Streetscape Video-Based Applications," presented at the *20th Embedded Vision Workshop at CVPR 2024*, Seattle, Jun. 17, 2024.

C. Zang, M. K. Turkcan, G. Zussman, J. Ghaderi, and Z. Kostić, "Data-Driven Traffic Simulation for an



Intersection in a Metropolis," in *Workshop on Populating Empty Cities: Virtual Humans for Robotics and Autonomous Driving*, CVPR, 2024 Seattle, June 2024.

Mehmet Kerem Turkcan, Chengbo Zang, Gyung Hyun Je, Aishwarya Patange, Mahshid Ghasemi, Yongjie Fu, Xuan Sharon Di, Gil Zussman, Javad Ghaderi, Zoran Kostic, "Integrated Object Detection, Tracking and Trajectory Forecasting for a New York City Street Intersection," *NSF/TIH PI Meeting and Workshop for Indo-US Collaboration*; May 2023.

Yongjie Fu, Mahshid Ghasemi, Mehmet Kerem Turkcan, Sharon Di, Gil Zussman, Zoran Kostic, Qiang Du, "Hybrid Twins for Urban Transportation: From Intersections to Citywide Management," *Columbia University Data Science Day*; Wednesday, April 19, 2023.

Award "2023 IDC Smart Cities North America Winner" for Smart City Project, The Digital Twin of New York City, <https://www.idc.com> <https://digitaltwin.engineering.columbia.edu/>

Zoran Kostic, "Applications of AI in Smart Cities and Healthcare," *Hanyang University*, Korea, November 6, 2023.

Zoran Kostic, "Applications of AI in Smart Cities and Healthcare," *Kyung Hee University*, Department of Electronics and Information Convergence Engineering, Korea, November 3, 2023.

Zoran Kostic, "Applications of AI in Smart Cities and Healthcare," *NATIONAL UNIVERSITY OF SINGAPORE, School of Computing, CS SEMINAR*, 4 October 2023, <https://events.comp.nus.edu.sg/view/21318>.

Zoran Kostic, "Applications of AI in Smart Cities and Healthcare," *ECE Seminar – Hong Kong University of Science and Technology (HKUST)*, 10 October 2023, <https://calendar.hkust.edu.hk/events/ece-seminar-applications-ai-smart-cities-and-healthcare>.

Mehmet Kerem Turkcan, Chengbo Zang, Gyung Hyun Je, Aishwarya Patange, Mahshid Ghasemi, Yongjie Fu, Xuan Sharon Di, Gil Zussman, Javad Ghaderi, Zoran Kostic, "Towards a Digital Twin of a New York City Street Intersection," *Columbia University 2023 Postdoctoral Research Symposium*; Thursday, May, 2023.

Choksi,S., Bitner, D., Zang, C., Cao, Y., Xiang, Z., Yarali, K., Szot, S., Kostic, Z., Filicori, F. (2023) Automatic Surgical Phase Recognition with *Artificial Intelligence Podium presentation: SAGES 2023* Montreal, Canada.

Choksi, S., Szot, S., Zang, C., Yarali, K., Cao, Y., Xiang, Z., Bitner, D., Kostic, Z., Filicori, F. (2023) Bringing Artificial Intelligence to the Operating Room: Edge Computing For *Real Time Surgical Phase Recognition Podium presentation: SAGES 2023* Montreal, Canada.

Zolnoori, M., Vergez, S., Sridharan, S., Zolnour, A., Rafiei, S., Bowles, K., Kostic, Z., & Topaz, M. (2023). Speaker type identification in audio recorded patient-nurse verbal communication in home healthcare setting. *AMLA Annual Conference*, New Orleans, LA. [Podium presentation].

Mahshid Ghasemi, Zhengye Yang, Mingfei Sun, Hongzhe Ye, Zihao Xiong, Javad Ghaderi, Zoran Kostic, and Gil Zussman. 2022. Video-based social distancing evaluation in the cosmos testbed pilot site. In *Proceedings of the 27th Annual International Conference on Mobile Computing and Networking (MobiCom '21)*. Association for Computing Machinery, New York, NY, USA, 874–876. <https://doi.org/10.1145/3447993.3510590>.

Jain, G., Hindi, B., Zhang, Z., Srinivasula, K., Xie, M., Ghasemi, M., Weiner, D., Paris, S.A., Xu, X.Y., Malcolm, M., Turkcan, M., Ghaderi, J., Kostić, Z., Zussman, G., & Smith, B.A. (2023). StreetNav: Leveraging Street Cameras to Support Precise Outdoor Navigation for Blind Pedestrians. *ArXiv*, *abs/2310.00491*.

Mehmet Kerem Turkcan, Sanjeev Narasimhan, Chengbo Zang, Sarah Choksi, Daniel P. Bitner, Filippo Filicori, Zoran Kostic, "Transfer Learning for Enhanced Phase Recognition in Data-Scarce Surgeries," *Columbia University Data Science Day*; Wednesday, April 19, 2023.

Yongjie Fu, Mahshid Ghasemi, Mehmet Kerem Turkcan, Sharon Di, Gil Zussman, Zoran Kostic, Qiang Du, "Hybrid Twins for Urban Transportation: From Intersections to Citywide Management," *Columbia University Data Science Day*; Wednesday, April 19, 2023.

Bitner DP (2023 April 1). Phase Recognition in Inguinal Herniorrhaphy - An Outsourced Competitive Model for AI implementation. [Poster Presentation]. Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) Annual Conference. Montreal, Quebec, CANADA.

Song, J., Zolnoori, M., Scharp, D., Vergez, S., McDonald, M.V., Sridharan, S., Kostic, Z., & Topaz, M. (2023) AI vs. Human Transcription: Accuracy Comparison for Identifying Hospitalization and Emergency Department Visit Risks in Home Healthcare Patient-Nurse Conversations. Poster presentation at Voice AI Symposium - The Bridge2AI-Voice Consortium, Washington. DC, 2023, April.

Z. Kostic, "Bringing Artificial Intelligence to the Operating Room – Edge computing for Real Time Surgical Phase Recognition," Society of American Gastrointestinal and Endoscopic Surgeons (SAGES), 4TH NBT INNOVATION Weekend, Los Angeles, Feb.3-4, 2023

Z. Kostic, "Bringing Artificial Intelligence to the Operating Room – Edge computing for Real Time Surgical Phase Recognition," Society of American Gastrointestinal and Endoscopic Surgeons (SAGES), 4TH NBT INNOVATION Weekend, Los Angeles, Feb.3-4, 2023.

Song, J., Zolnoori, M., Scharp, D., Vergez, S., McDonald, M.V., Sridharan, S., Kostic, Z., & Topaz, M, "Potential Utilization of New Data Stream in Home Health Care: Patient-Nurse Verbal Communication," Presentation session at workshop AI in Nursing 2022 (concurrently with the 20th International Conference on Artificial Intelligence in Medicine (AIME2022)), Halifax, Canada, June 2022.

M. Ghasemi, Z. Yang, M. Sun, H. Ye, Z. Xiong, J. Ghaderi, Z. Kostic, and G. Zussman, "Demo: Video-based social distancing evaluation in the COSMOS testbed pilot site," in *Proc. ACM MOBICOM'21*, 2021.

Z. Yang, M. Sun, H. Ye, Z. Xiong, G. Zussman, and Z. Kostic, "Birds eye view social distancing analysis system," arXiv:2112.07159 [cs.CV], Dec. 2021.

Alex Angus, Zhuoxu Duan, Jingyuan Liu, Joseph Yang, Xingxing Geng, Zoran Kostic, "Privacy Preserving Object Detection in COSMOS Smart Intersection," Smart Cities Poster Session, DSI Columbia University, Friday, November 5, 2021. <https://www.dsiposters.com/smart-cities-fall-2021>

M. Ghasemi, Z. Kostic, J. Ghaderi, and G. Zussman, "Auto-SDA: Automated Video-based Social Distancing Analyzer," in DSI Smart Cities Poster Session, Columbia University, New York, NY, Nov 5, 2021.

Richard Samoilenko, Ashvin Jagadeesan, Zihao Xiong, Hongzhe Ye, Zhengye Yang, Zoran Kostic, "Optimizing YOLOv4 Object Detection in Smart-City Traffic Intersections," at *Columbia University Data Science Day*, Wednesday, April 21, 2021.

Mahshid Ghasemi, Zhengye Yang, Mingfei Sun, Hongzhe Ye, Zihao Xiong, Zoran Kostic, Javad Ghaderi, Gil Zussman, "COSMOS Testbed – Proximity Detection and Social Distancing Estimation in COVID-19 Pandemic," *Workshop on Challenges for Digital Proximity Detection in Pandemics: Privacy, Accuracy, and Impact*, NIST, January 26, 2021 - January 28, 2021.

Zhengye Yang, Mingfei Sun, Hongzhe Ye, Zihao Xiong, Gil Zussman, Zoran Kostic, "Privacy Preserving Social Distancing Analysis in a Metropolis," in *Machine Learning in Science & Engineering*, Data Science Institute at Columbia University, Virtual Conference, December 14 - 15, 2020.

Zoran Kostic, "Object Detection in Smart City Intersections: Real-time Considerations," *2nd COSMOS Research Community Workshop*, Oct 14-15, 2020.

Zoran Kostic, "COSMOS Smart Traffic Intersection: High-Bandwidth Low-Latency Applications using AI and Edge Computing Infrastructure - A Snapshot on Real Time Consideration," *IEEE 5G World Forum - AI/ML Track*, Sept 10-12, 2020.

COSMOS Smart Traffic Intersection: High-Bandwidth Low-Latency Applications using AI and Edge Computing Infrastructure - A Snapshot on Real Time Consideration, *IEEE 5G World Forum - AI/ML Track*, Sept 10-12, 2020.

Zhengye Yang, Emily Bailey, Shiyun Yang, Gil Zussman, Ivan Šeškar, Zoran Kostic, "Smart City: Deep Learning in the Edge-Cloud for COSMOS Smart Intersection," *Data Science Day*, Columbia University, Tuesday, March 31, 2020.

Zoran Kostic, "Deep Learning in the Edge-Cloud for COSMOS Smart Intersections," *IEEE Workshop on AI/ML in Networks and Cloud*, Feb 17, 2020; Rutgers University Inn and Conference Center; New Brunswick, New Jersey.

COSMOS team, "COSMOS REM/RET program and educational toolkit," nominated for the *Global Mobile Awards - category on YoMo STEAM Activity for Young People*, at the 2020 Mobile World Congress (event postponed).

Z. Kostic, "Smart City Intersections," *COSMOS Experimenters Workshop*, Rutgers University, May 21, 2019.

Z. Kostic, COSMOS PIs, "Panel: The COSMOS Advanced Wireless Testbed: integrating Gigabit wireless access with low latency edge computing," *EDGE 10 Conference on Edge & Fog*, Friend Center, Princeton University, NJ, May 17, 2019, <http://edge10.princeton.edu>.

Zoran Kostic, "COSMOS Project - Opportunities for Health Applications," *Columbia Data Sciences Institute (DSI) Health Analytics workshop*, Columbia University, New York City, March 1, 2019.

Zoran Kostic and Ivan Šeškar, "Smart City Intersections in Megapolises," *Sense, Collect and Move Data Seminar*, Columbia Data Sciences Institute (DSI), New York City, Oct. 12, 2019.

Zoran Kostic et. al, "Pedestrian and vehicle tracking in bird's eye view videos," *Smart Cities Center Poster Session*, Columbia Data Science Institute, New York City, November 14th, 2018 .

Tianyao Hua and Zoran Kostic, "Pedestrian and vehicle tracking in bird's eye view videos," *Columbia Data Sciences Institute (DSI) Summer Student 2018 EE Expo*, New York City, 2018.

Zoran Kostic, "COSMOS overview," *Columbia Data Sciences Institute (DSI) retreat*, Tarrytown, New York, October 7-8, 2018.

Zoran Kostic, "Smart City: Deep Learning Models for Car-Pedestrian Interaction," NVIDIA GPU Technology Conference, San Jose, March 25-29, 2018.

Zoran Kostic, "Internet of Things - Physical Data Analytics," *Workshop Chair, IEEE International Conference on Sensing, Communication and Networking*, 27-30 JUNE 2016, LONDON, UK.

Zoran Kostic, "The Next Big Revolution: Internet of Things," Invited talk and panel moderator, *Japan Society*, September 26, 2016, NYC.

## **SELECTION OF PROFESSIONAL ACTIVITIES BEFORE 2015**

Editor for IEEE Transactions on Wireless Communications

Editor for IEEE Transactions on Communications

Editor for IEEE Letters on Communications

Organizer and Chair of two dozen of conference sessions in mobile and wireless communications.

Participant in NSF panels.