

**COMMUNICATION NETWORK RESEARCHER | COMPUTER SCIENTIST
SENIOR SOFTWARE ENGINEER**

Prolific and innovative scientist. Perform state-of-the-art research and contribute to system development in a broad spectrum of areas. Made prominent contributions to wireless and wireline network management systems, which enable new capabilities and improve performance. Proven record of leading and participating in diverse, award-winning research teams.

Experienced and independent software engineer. Designed and developed advanced systems for managing, analyzing and visualizing large datasets of research results and performance evaluations based on user data. Implemented network protocols. Developed CAD tools for VLSI chip design.

Leverage deep knowledge of algorithms, optimization methods, and stochastic analysis to creatively resolve difficult system design challenges. Knowledgeable about database, data mining and machine learning methods. Expertly communicate advanced research solutions to technical and non-technical audience.

- Algorithms
- Network Design & Management
- TCP / IP Networks
- WiFi
- LTE
- Data Analysis
- Data Visualization
- Stochastic Analysis

TECHNICAL/SPECIALIZED SKILLS

- Wireless Networks:** IEEE 802.11 (WiFi) Networks and Medium Access Control (MAC) Protocol, LTE-eMBMS (multicast) Monitoring and Management, LTE Online Charging System (OCS) and Smart Pricing, Mobility Management, Internet-of-Thing (IoT) and Sensor Network Management, Self-Organizing Networks (SON), Ad-hoc Networks
- Wireline Networks:** TCP/IP protocols, MPLS, Multicast, Fault Resilient Routing, Energy Efficient IP networks, IPTV, Ethernet Topology Discovery, SDN
- Algorithms:** Combinatorial Optimization, Approximation Algorithms, On-Line Algorithms
- Programming:** Python, Java, C, JavaScript, JSP, HTML, MySQL, Google Visualization API
- Platforms:** Amazon EC2, Unix, Windows

EDUCATION

Doctor of Philosophy (PhD), Electrical Engineering
TECHNION, ISRAEL INSTITUTE OF TECHNOLOGY, advisor: Prof. Israel Cidon

Master of Science (MSc), Computer Science
TECHNION, ISRAEL INSTITUTE OF TECHNOLOGY, advisor: Prof. Adrian Segall

Bachelor of Science (BS), Computer Science
TECHNION, ISRAEL INSTITUTE OF TECHNOLOGY, *summa cum laude*

PUBLICATION SUMMARY

42 conference papers, 21 journal papers, 2 book chapters,
68 patents (US and international), 10 pending US patent applications

- A complete list of publications and patents will be provided upon request.

PROFESSIONAL EXPERIENCE

NOKIA BELL-LABS, Murray-Hill, NJ, USA

2000 – 2017

Member of Technical Staff

Developed advanced solutions for wireless and wireline network design, management and optimization:

- **DyMo: Dynamic Management of Very Large Wireless Systems [2016-2017]** – Led collaboration between Bell-Labs and Columbia University for developing multicast-based mechanisms for low-overhead management, configuration, and information retrieval from mobile devices in very large wireless networks. Evaluated solution for LTE-eMBMS (LTE multicast services) networks with thousands of users and demonstrated optimal parameter tuning (e.g. transmission bit-rate) with only 5 feedback messages per second from all users. 2 papers and 2 patents.
 - Achieved top 3% review score ranking among all submissions for resulting INFOCOM'17 paper.
 - Presented solution at European Broadcasting Union (EBU) meeting in February 2017.
- **AMuSe: Adaptive Multicast Services for WiFi Networks [2013-2016]** – Led collaboration between Bell-Labs and Columbia University to develop WiFi-based distribution system of live video feeds for crowded venues like stadiums and theme parks; successfully tested system on ORBIT testbed in Rutgers University with 200 WiFi nodes. 5 papers and 5 patents, including invited paper at the IEEE ICCCN 2016 conference.
 - Received 2nd prize at NYC Media Lab Summit, 2015, for web-based demo of AMuSe, in competition with over 100 technological demos.
 - Participated in NYC Media Lab Combine Program for Entrepreneurship 2016 (15% acceptance ratio).
- **CEDAT: Concept Evaluation Demonstration and Analysis Tool [2014-2016]** – Developed web-based tool which sped up evaluation of research concepts and demonstration of results and produced interactive reports based on organization and analysis of large-scale evaluations based, including animations of time-varying scenarios. Developed a language to specify required evaluations and reports. Implemented on Amazon EC2 cloud with Java EE, Python, JavaScript, HTML, MySQL and Google Visualization API.
- **Smart-Pricing [2012 – 2014]** – Co-developed advanced algorithmic solutions which managed group mobile data plans while minimizing signaling overhead, including schemes for post-pay and pre-pay data plans as well as solutions for hierarchical data plans for enterprises. Maximized profit from wireless sponsored content for service providers by co-developing additional online algorithms. Developed large scale evaluation system to evaluate proposed solutions on user data. 2 papers and 3 patents.
- **PANDA – Power Aware Network Design and Auto-configuration [2011 – 2013]** – Co-developed energy efficient IP networks that met traffic demands while activating minimal number of network components. 5 papers and 2 patents.
 - Received Outstanding Paper Award at IEEE HPSR 2012 conference.
- **RMT-Based Fault Resilient Routing [2008 – 2012]** – Co-developed advanced fault resilient schemes for unicast and multicast connections based on Redundant Multicast Trees (RMTs) concept, dynamically handling node and link failures while minimizing required recovery bandwidth allocation. 5 papers and 5 patents.
 - Received Best Paper Award of IEEE HPSR 2013 conference.
- **OASIS: Overlay-Assisted Services for Infrastructure Systems [2009 – 2010]** – Led team that developed advanced wireless management schemes that leverage multiple smartphone interfaces (3G/LTE and WiFi) to reduce management overhead and improve service quality, including solutions using relay nodes. 1 paper and 3 patents.
 - Team became 1 of 6 finalists of the Alcatel-Lucent Americas Entrepreneurial Boot Camp 2010 from over 130 submissions.

Member of Technical Staff (continued)

- Coordinate-free Management of Wireless Sensor Networks [2007 – 2010] – Co-developed advanced management schemes for large wireless sensor networks (Internet of Things) which ensured full coverage verification of monitored area while maximizing network lifetime. 6 papers and 1 patent.
- MAZA: Multicast Assist Zap Acceleration [2006 – 2007] – Developed multicast-based system, improving zap (channel change) response time of IPTV systems while ensuring efficient network resource utilization. 1 paper and 1 patent.
- Rodin [2002 – 2007] – Co-developed network management solutions for monitoring and performance optimization of large-scale WiFi networks, including frequency planning solutions as well as user association control and cell-breathing methods for balancing traffic load on access points. 9 papers and 8 patents.
- Pharos [2005 – 2006] – System architect of advanced management system for dynamic wireless mesh network which provided connectivity between ships near harbor and shore by dynamically selecting limited numbers of directional wireless links to ensure high-quality, fault resilient communication. Joint project between Bell-Labs and Lucent Professional Services. 2 papers and 1 patent.
- CAN: Configurable Access Network [2003 – 2005] – Co-developed efficient management schemes for wireless mesh networks which leveraged connectivity between wireless mesh networks and wired infrastructure to simplify network management while ensuring performance guarantees. 5 papers and 2 patents.
- DOVE: DO Voice Evaluation [2003 – 2004] – Co-developed advanced passive monitoring platform scheme utilizing EVDO (Evolution Data Optimized) HDR (High Data Rate) protocol stack properties which evaluated service quality of VoIP (Voice over IP) traffic in EVDO cellular networks.
- Mobility Management and tracking area design [2002 – 2003] – Developed sophisticated schemes for optimizing tracking areas of cellular networks, reducing signaling overhead for both update and search operations. 2 papers and 1 patent.
- Fault Resilient Routing [2002 – 2003] – Developed novel routing mechanisms that provisioned primary and backup paths in wired networks with bandwidth guarantees and delay constraints. 4 papers and 2 patents.
- NetInventory [2000 – 2002] – Co-developed advanced topology discovery schemes for heterogeneous multi-subnet Ethernet networks based on very limited connectivity information. 3 papers and 2 patents.
 - Team received Bell-Labs President's Gold Award.
- Network Monitoring [2000 – 2001] – Co-developed schemes for efficient monitoring of delays and faults in IP-based networks by using minimal number of probing agents. Book chapter, 2 papers and 1 patents.

ADDITIONAL EXPERIENCE**TECHNION, Electrical Engineering Department**, PhD Student, Haifa, Israel

Developed various mobility management and hand-off schemes for cellular networks and mobile IP networks which reduced signaling overhead for both update and search operations. Book chapter and 8 papers.

INTELLIGENT INFORMATION SYSTEM (I.I.S), Senior Software Engineer, Haifa, Israel

Developed communication products, including design and implementation of Logical Link Control (LLC) standard and TCP/IP protocol stack for communication controllers.

INTEL-ISRAEL R&D CENTER, Computer Engineer, Haifa, Israel

Worked with CAD (Computer Aided Design) group. Developed and implemented algorithms for logical synthesis of VLSI chips.

TEACHING EXPERIENCE

- Ph.D. studies: Taught various undergraduate and graduate level courses: Operating Systems, Introduction to Communication Networks, Network Design, TCP/IP and Internet Architecture, High-Speed Networks and Asynchronous Transfer Mode (ATM).
- M.Sc. studies: Taught various courses, including Operating Systems, Introduction to Communication Networks, High-Speed Networks and Asynchronous Transfer Mode (ATM).

PROFESSIONAL ACTIVITIES

- Associate Editor of the IEEE/ACM Transactions on Networking (ToN), 2011 – 2016.
- Program Committee member: IEEE INFOCOM 2002 – 2007, 2010 – 2013, 2015 – 2017, IEEE WiOpt 2006, ACM MOBICOM 2011, IEEE HPSR 2013, ACM MOBIHOC 2015, IEEE LCN 2015 – 2016.
- Referee for international conferences: IEEE INFOCOM, ACM MOBICOM, IEEE GLOBECOM, ACM PODC, IEEE WiOpt and ACM Dial-M.
- Referee for international journals: IEEE/ACM Transactions on Networking (ToN), IEEE Transactions on Mobile Computing (TMC), IEEE Journal on Selected Areas in Communication (JSAC), Journal of Communications and Networks (JCN).

HONORS

1. NYC Media Lab Combine Program: V. Gupta, C. Gutterman, G. Zussman, Y. Bejerano (mentor). AMuSe project participated in 2016 NYC Media Lab Combine Program for Entrepreneurship (only 15% of projects accepted).
2. Second Prize for demo: V. Gupta, R. Norwitz, S. Petridis, C. Gutterman, G. Zussman, Y. Bejerano, "AMuSe: Adaptive Multicast Services for Wireless Video Distribution in Large Venues", in competition with over 100 technological demos from universities and companies in NYC area in NYC Media Lab Summit, 2015.
3. Best Paper Award: Y. Bejerano, P. V. Koppol, "Link-Coloring Based Scheme for Multicast and Unicast Protection", IEEE Conference on High Performance Switching and Routing (HPSR), July 2013.
4. Outstanding Paper Award: S. Antonakopoulos, Y. Bejerano, P. V. Koppol, "A Simple IP Fast Reroute Scheme for Full Coverage", IEEE Conference on High Performance Switching and Routing (HPSR), June 2012.
5. Led 1 of the finalist teams at Alcatel-Lucent Americas Entrepreneurial Boot Camp 2010 (Only 6 accepted proposals from 130 submissions).
6. Alcatel-Lucent Technical Academy Member – Elected in 2010.
7. Bell-Labs President's Gold Award 2004 for breakthrough research and development for NetInventory project.
8. Bell-Labs President's Teamwork Award 2003 for NetInventory project.

ACADEMIC AWARDS

9. Levi Eshkol Scholarship of the Israeli Ministry of Science and Technology.
 10. Intel Prize of Excellence for graduate students.
 11. Gutwirth Scholarship for outstanding graduate students.
 12. 3-time Technion President's Award for distinguished undergraduate students.
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