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Head of Applied Machine Learning Research, NOKIA Bell Labs
Adjunct Professor, Computer Science Dept., NJIT & NYU

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Profile

Recognized industry leader with a track record of helping R&D teams develop new ideas from inception to proof of concept and products. I love to [code](#) and have a diverse skillset that includes Wireless Communications, Machine Learning, Cloud Computing, Robotics / Self-Driving Cars, and Software Architecture. I like helping young people and give back to the community by teaching and mentoring.

Publications (25)

[Google Scholar Results](#)

h-index: 23
citations: 2054

Patents (42)

[Google Patents Results](#)

Programming and Skills

Python, Matlab, C++, Tensorflow, JIRA, Scrum.

Memberships

Acumos AI Project
Technical Steering Committee
2018-2019
<https://www.acumos.org>

Linux Foundation AI
Technical Advisory Board 2018 -
<https://lfai.foundation>

Awards

Two times recipient of the Bell Labs President's award for outstanding research.

Work Experience (last 10 years)

Adjunct Professor NJIT and NYU

2019 – Present

At NYU I am teaching, [a graduate level Artificial Intelligence course](#). At NJIT, I teach both graduate and undergraduate level classes on [Data Mining for Structured and Unstructured Data](#).

Head of Applied Machine Learning Research, Bell Labs

2018 – Present

Leading departments in US and Europe (15 engineers) that apply new machine learning methods to multisensory streaming data met in industrial automation and machine-human interaction. We work primarily on real-time scene understanding from infrastructure and mobile robotic camera streams, on gesture recognition from Electromyography (EMG) signals and general perception and localization algorithms. I have the final responsibility for the research backlog, for delivering the PoCs into [products such as Scene Analytics](#) and demonstrating **real-time deep learning algorithms** processing video and other streams to customers in [FutureX](#) - a dedicated space in Murray Hill, NJ hosting tens of network cameras and mobile robots connected via a plethora of 5G network technologies to edge GPUs. We contribute some of our learnings to the open source communities under the Linux Foundation and adopt open platforms such as [Kubeflow](#) and [World Wide Streams \(WWS\)](#) to help realize our vision of cloud-native fully automated ML application orchestration.

Group Leader, Architecture & Technology, Mobile Networks, Nokia

2015 – 2018

Lead squads in US, France, Poland, Germany and China (100+ engineers) in the area of LTE/5G performance simulation. Developed algorithms and simulation platforms that power the resource management of millimeter wave 5G networks and embedded machine learning and optimal control algorithms to make them autonomous. We worked with Linux Foundation communities such as [ONAP](#) to contribute applications that demonstrate the advances in operational efficiency that our ML-based RRM optimization algorithms can offer. I had overall responsibility for delivering simulation results for 5G mmwave to the product, research backlog responsibility for advanced features and overall responsibility of developing and operating the **Simulation as a Service (SIMaaS)** platform, a web service that helped internal teams and customers validate our system design and MAC algorithms in real world LTE/5G deployments, much ahead of the actual deployment of 5G equipment in the field.

Director, Wireless CTO, Nokia

2009 – 2015

Lead the **Self Organizing Network as a Service (SONaaS)** prototype development effort that demonstrates data mining and autonomous self-optimization network algorithms exposed as services in operator clouds. The team delivered the solution from concept and algorithm research all the way to customer trials in live networks. Several apps were developed: (a) Machine Learning apps that help parameter optimization algorithms in LTE networks based on mining the UE measurement reports. (b) traffic intensity prediction algorithms, (c) optimal placement policies of small cells in urban areas and many others. We were the first team worldwide to use ML in LTE for what is currently called the CRAN architecture and our papers continue to get tens of citations each year.

Distinguished Member of Technical Staff, Alcatel-Lucent

2005 – 2009

Delegation lead to the 3GPP2 standards development team. Lead role in developing and standardizing a proposal covering all aspects of a brand new air-interface from physical layer to radio resource management. Developed C++ system simulation software for supporting the proposal during the UMB standardization effort and inserted many technologies we had IPR on, in the UMB specifications.

Principal Architect, Invento Networks Inc.

2004 – 2005

Lead a system design team in this startup, founded by colleagues at Lucent, that aspired to develop WiMAX-based mesh networking to provide fixed-wireless alternatives in the US market. I was responsible for systems design of the mesh node (base station) that included architecture and performance validation. The technology didn't get any traction, partly due to the emergence of LTE and the company folded.

Education

Self-Driving Car Engineer (online)

Udacity, Online (2018)

Year-long degree program teaching all aspects of self-driving car engineering and algorithms from perception systems to optimal control / planning. A real Robotic Operating System-based car was used to showcase the results of our capstone project.

Selected Courses (online)

Columbia University, NY (2009-2012)

Machine Learning, Optimization Techniques for Financial Engineers, Corporate Finance, Yield Management

Ph.D. in Communications Theory

University of Surrey, UK (1994)

3G Interference Rejection Receivers and Channel Coding

M.Sc in Telematics
University of Surrey, UK (1991)

B.Eng in Electronics
(with Highest Honors)
Technological Education Institute of Athens (1990)

Publications

BOOK CHAPTERS

“HTN Mobility Management”, Chapter in “[Heterogeneous Cellular Networks](#)”, Wiley, 2013.

JOURNALS

(this paper has tens of citations)

S. Deb, P. Monogioudis, “[Learning Based Uplink Interference Management in 4G LTE Cellular Systems](#)”, IEEE Transactions on Networking, April 2015

(this paper has hundreds of citations)

S. Deb, P. Monogioudis, J. Miernik, J. Seymour, “[Optimal eICIC algorithms for LTE Heterogeneous Networks](#)”, IEEE Transactions in Networking, 2014.

[Hai Zhou, Sparks, K., Gopalakrishnan, N., Monogioudis, P., Dominique, F., Busschbach, P., Seymour, J., “De-prioritization of Heavy Users in Wireless Networks”](#), IEEE Communications Magazine, Nov 2011.

S. Das, S. Li, P. Monogioudis, S. Nagaraj, S. Ramakrishna, A. Rudrapatna, V. Sivarama, S. Vasudevan, H. Viswanathan, J. Zhou, “[EVDO Rev. C: Evolution of the cdma2000 Data Optimized System to Higher Spectral Efficiencies and Enhanced Services](#)”, Accepted for publication, Bell Labs Technical Journal, Vol.11 No.4 (2007)

P. Monogioudis, K. Conner, D. Das, S. Gollamudi, J. Lee, A. Moustakas, S. Nagaraj, A. Rao, R. Soni, Y. Yuan, “[Intelligent Antennas for UMTS - Algorithms and Simulation Results](#)”, IEEE Communications Magazine, Oct 2004, Special issue on Smart Antennas.

Berruto, E., Colombo, G., Monogioudis, P., Napolitano, A., Sabatakakis, K., “[Architectural aspects for the evolution of mobile communications toward UMTS](#)”, IEEE Journal on Selected Areas in Communications, Volume: 15 8, Oct. 1997, Page(s): 1477 -1487

Francis, J.C., Elberse, A., Gobbi, R., Rogl, P., Ciancetta, M.C., Monogioudis, P., Nelson, J., “[Evolutionary mobility and service support in DECT access networks](#)”, IEEE Journal on Selected Areas in Communications, Volume: 15 8, Oct. 1997, Page(s): 1488-1497

P. Monogioudis, “[Wide Area Mobility](#)”, Mobile Europe, January 1996, Vol. 6, Number 1, Page(s): 20 – 23

Monogioudis, P.N., Tafazolli, R., Evans, B.G., “[Linear adaptive fractionally spaced equalization of CDMA multiple-access interference](#)”, Electronics Letters Volume: 29 21, 14 Oct. 1993, Page(s): 1823 -1825

Monogioudis, P.N., Tafazolli, R., Evans, B.G., "[*Performance of adaptive nonlinear NEFAR CDMA receiver architecture*](#)", Electronics Letters Volume: 30 3, 3 Feb. 1994, Page(s): 192 -193

CONFERENCES

Wang, Dandan and Hosangadi, Gurudutt and Monogioudis, Pantelis and Rao, Anil, "Mobile Device Localization in 5G Wireless Networks", 2019 International Conference on Computing, Networking and Communications (ICNC)

Capdevielle, Veronique, Monogioudis, Pantelis, Weaver, Carl, Pugeat, Jean-Michel and Myers, Steve, "*Learning based spectral clustering for LTE downlink CoMP systems*", 14th IEEE Annual Consumer Communications & Networking Conference (CCNC 2017)

(this paper has tens of citations) Avik Ray, Supratim Deb, Pantelis Monogioudis, "[*Localization of LTE measurement records with missing information*](#)", IEEE INFOCOM 2016-The 35th Annual IEEE International Conference on Computer Communications

S. Nagaraj, P. Monogioudis, "*Interference Cancellation DFT-Precode CDMA in Next Generation OFDMA Communications*", Globecom 2007.

S. Nagaraj, P. Monogioudis, "*Antenna Verification for Closed Loop Transmit Diversity in UMTS*", Vehicular Technology Conference (VTC) 2004.

A. Moustakas, P. Monogioudis, "*Phase Sweep Transmit Diversity for Shared Data Channels - A Critical Analysis*", Globecom 2003, Vol. 4, Page(s):2192-2197, Dec. 2003.

Monogioudis, P., Tafazolli, R., Evans, B.G., Edmonds, M., "*Multirate 3rd generation CDMA systems*", Communications, 1993. ICC '93 Geneva. Technical Program, Conference Record, IEEE International Conference on, Volume: 1, 1993, Page(s): 151 -155 vol.1

Monogioudis, P., Tafazolli, R., Evans, B.G., "*LFSE interference cancellation in CDMA systems*", Communications, 1994. ICC '94, Conference Record, Page(s): 1160 -1163 vol.2

Monogioudis, P., Tafazolli, R., Evans, B.G., "*Autonomous CDMA multipath diversity receiver*", Spread Spectrum Techniques and Applications, 1994. IEEE ISSSTA '94, IEEE Third International Symposium on Spread Spectrum Techniques and Applications, 1994, Page(s): 430 -434 vol.2

Monogioudis, P.N., Tafazolli, R., Evans, B.G., "*Multimedia advanced CDMA system*", Fourth IEE Conference on Telecommunications (Conf. Publ. No. 371), 1993, Page(s): 11 -16

PATENTS

TBP

P. Monogioudis, Gabor Soros, "System and Method for extrinsic calibration of infrastructure using an egomotion-aware marker", Filled, Jan 2020

US15837621

P. Monogioudis, T. Sanam, Dandan Wang,

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| | Autonomous localization in wireless networks , Application Published 6/2019 |
| 9,326,163 | S. Deb, P. Monogioudis, " Methods and systems for reducing interference in networks ", Granted 2016 |
| 8,787,351 | Monogioudis, P., "Method and apparatus for scheduling transmissions in a communication network", Granted 2014 |
| 8,630,652 | Monogioudis P., " Method And Apparatus For Optimizing The Location Of Heterogeneous Underlaid Evolved Node-Bs ", Granted, 2014 |
| 8,649,269 | Monogioudis P., " Method of Controlling Resource Usage in Communication Networks ", Granted, 2010 |
| 8,559,917 | S. Deb, P. Monogioudis, " Method, apparatus and computer readable medium for associating user equipment with a cell ", Granted, 2013 |
| 8,442,442 | Monogioudis P., Vasudevan Subramanian, " Method of Assigning Scrambling Codes and Reducing Interference ", Granted 2013. |
| 8,159,974 | Monogioudis P., " Method of Configuring Interfaces Between a Plurality of Communication Nodes ", Issued 2012 |
| 7,894,402 | Monogioudis P., Gollamudi S., Soni A., " High Rate Packet Data Spatial Division Multiple Access (SDMA) ", Filed 2005. |
| 7,787,530 | Gollamudi S. and Monogioudis P., " Multi-channel Adaptive Quality Control Loop for Link Rate Adaptation in Packet Data Communications ", Published 2003. |
| 7,558,151 | Monogioudis P., Nagaraj S., Viswanathan H., " Method Of OFDM Communication Using Superposition Coding ", Issued 2009. |
| 7,515,927 | Monogioudis P., Viswanathan H. " Method Of Reverse Link Dynamic Power Control In A Wireless Communication System Using Per-Flow Quality Feedback For Multi-Flow Data Traffic ", Issued 2009. |
| 7,453,933 | Jeske D., Monogioudis P., Rege K., Sampath A., " Method of estimating a signal-to-interference ratio (SINR) using data samples ", Filed 2002. |
| 7,430,237 | Monogioudis P., Rege K., " Decoder-less bit-error-rate estimation for convolutional encoded transmissions in wireless systems ", Issued Sept 2008. |
| 7,406,335 | Benning R., Kogiantis A., Monogioudis P., Moustakas A., Ozarow L., Simon S., " Multiple Antenna Transmissions with Deterministic Phase Differences ", Published 2004. |
| 7,169,956 | Gollamudi S. and Monogioudis P., " Adaptive Quality Control Loop for Link Rate Adaptation in Packet Data Communications ", Published 2002. |
| 7,158,484 | Ahmed W., Doshi B., Jiang H., Monogioudis P., Rege K., " Methods and apparatus for topology sensing in networks with mobile nodes ", Granted, 2007. |
| 7,076,015 | Bhatoolaul D. and Monogioudis P., " Preamble Detection for a CDMA Receiver ", Issued July 2006. |
| 7,065,159 | Monogioudis P., Rege K., " Compensation based bit-error-rate estimation for convolutional encoded transmissions in wireless systems ", Issued June 2006. |
| 7,009,949 | Gopalakrishnan N., Kogiantis A., Khan F., Monogioudis P., Sampath A. " Asymmetric rate feedback and adjustment system for wireless communications ", Issued Mar 2006. |

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|----------------|---|
| 7,006,841 | Monogioudis P., Rege K., " <u>Method to control base station transmit power drift during soft handoffs</u> ", Issued Feb 2006. |
| 7,006,464 | Gopalakrishnan N., Khan F., Monogioudis P., Sampath A. " <u>Downlink and Uplink Channel Structures for Downlink Shared Channel System</u> ", Issued Feb 2006. |
| 7,006,453 | Ahmed W., Doshi B., Jiang H., Monogioudis P., Rege K., " <u>Location Based Routing for Mobile Ad-Hoc Networks</u> ", Issued Feb 2006. |
| 6,965,780 | Monogioudis P., Rege K., Sampath A., " <u>Reverse link Outer-loop Power Control with Adaptive Compensation</u> ", Issued Nov 2005. |
| 6,952,561 | Kumar S., Monogioudis P., Rege K., Sampath A. " <u>An Enhanced Metric for Bit Detection on Fading Channels with Unknown Statistics</u> ", Issued Nov 2005. |
| 6,915,477 | Gollamudi S. and Monogioudis P., " <u>Delay Sensitive Adaptive Quality Control Loop for Rate Adaptation</u> ", Issued Sept 2005. This patent is fundamental in the design of HSDPA schedulers. |
| 6,765,896 | Ahmed W., Doshi B., Jiang H., Monogioudis P., Rege K., " <u>Address option for use in an internet protocol-based multimedia mobile network</u> ", Issued July 2004 |
| 6,735,202 | Ahmed W., Doshi B., Jiang H., Monogioudis P., Rege K., " <u>Mobility management techniques for use in an internet protocol-based multimedia mobile network</u> ", Issued May 2004. |
| 6,690,659 | Walid A., Doshi B., Hong J., Monogioudis P., Rege K., " <u>Addressing techniques for use in an internet protocol-based multimedia mobile network</u> ", Issued Feb 2004. |
| 6,647,005 | Cao Q., Monogioudis P., Lin, J., " <u>Transmission power control for packet switched communications systems</u> ", Issued Nov. 2003. This patent was judged as <i>fundamental</i> for the UMTS Release 6 radio interface (fractional DPCH channel). |
| 5,550,810 | Monogioudis P., Edmonds M., " <u>Direct sequence code division multiple access (DS-CDMA) communication system and a receiver for use in such a system</u> ", Issued Aug. 1996. One of the earliest patents in the field, it is referenced by tens of other patent applications in the area the interference cancellation. |
| US Application | Monogioudis P. " <u>Wireless Communications System Employing OFDMA and CDMA Techniques</u> ", Filed 2006. This patent application reads into the text of Revision-C 3GPP2 specifications. |
| US Application | Monogioudis P., Venkatesan S., " <u>System and Method of Joint Beamforming</u> ", Filed 2008. |
| US Application | Monogioudis P., " <u>Dynamic Spectrum Access System and Method</u> ", Filed 2010 |
| US Application | Braun V., Monogioudis P., " <u>User Admission, Power, Rate and Mobility Control for Relay Communication Systems</u> ", Filed 2011. |
| US Application | Monogioudis P., Ilya Korich, R. Soni, " <u>System and Method for Circular Antenna Array (CAA) Precoding</u> ", Published 2013 |

References

Can be provided upon request recommendation letters from colleagues at Nokia, Verizon, AT&T, NJIT and other organizations.

