BABAK HOSSEINKHALAJ

Professor and Head of the Electrical Engineering Department
Director of Sharif Center for Information Systems and Data Science
Sharif University of Technology
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EDUCATION

Ph.D. in Electrical Engineering, *Stanford University*, Stanford, CA, June 1996.
M.S. in Electrical Engineering, *Stanford University*, Stanford, CA, April 1993.
B.S. in Electrical Engineering, *Sharif University of Technology,* Tehran, February 1989.

AREAS OF RESEARCH

- Novel Learning, Large Language and Foundation Models, and Big Data Analytics
- Next Generation and AI-based 5G-6G Wireless Networks Analysis and Design
- Predictive Maintenance Algorithms

EXPERIENCE

December, 1999 – Now
Professor of Electrical Engineering
Sharif University of Technology

July, 2018 – September, 2018
Nokia Visiting Professor Scholarship
University of Oulu, Oulu, Finland

August, 2015 – September, 2015
Erasmus-Mundus Visiting Professor
Technical University, Berlin, Germany

August, 2007 – September, 2008
Fellow of Alexander von Humboldt Foundation
Technical University of Darmstadt, Germany

September, 2006 – August, 2007
Visiting Professor
Communication Systems and Mathematical Principles of Information Group
CEIT (Centro de Estudios e Investigaciones Tecnicas de Gipuzkoa), San Sebastian, Spain

May, 1999 – August, 1999
Senior Design Eng. at Ikanos Communications, California
Simulation and design of burst-mode xDSL signal estimation and synchronization algorithms
Design and implementation of optimum multi-input multi-output NEXT/FEXT crosstalk and echo cancellation systems

November, 1996 – May, 1999
Sr. Member of Tech. Staff, Advanced R&D Dept., Advanced Fibre Communications, California
Design and implementation of broadband VDSL telecommunication systems
Modeling and simulation of xDSL systems and spectral compatibility studies

High speed DSP-based clock recovery and convolutional interleaving algorithms
Fast Reed-Solomon encoding and decoding techniques for DSP-based modems

June, 1995 - November, 1996
Sr. Algorithm Design Engineer at Corporate Technology Dept., KLA Instruments, California
Signal detection and estimation algorithms for inspection and analysis of difficult wafer layers using advanced imaging techniques; two dimensional defect classification and analysis

October, 1991 - June 1995
Research Assistant at Information Systems Lab., Stanford University, Stanford, California
Supervisor: Prof. Thomas Kailath
Research Topics: Antenna arrays technology for CDMA/TDMA cellular networks, multi-channel wireless channel estimation and modeling, modern signal processing techniques for inspection of patterned wafers, blind spatio-temporal channel identification, distortion compensation techniques for accurate overlay and lithography

June, 1993 - September 1993
Member of Tech. Staff at Digital Comm. Research Dept., AT&T Bell Labs, New Jersey
DSP-implementation of Cellular Digital Packet Data (CDPD) decoding algorithms
Design of high-capacity antenna array-based multi-user TDMA algorithms

PATENTS

1. **US Patent # 11,343,241 B2**: Azad Ravanshid, Alireza Mohammadi, Ali Farahbakhsh, Niusha Moshrefi, Babak Hosein Khalaj, *"Multi-connectivity Communication*", issued May 24, 2022.
2. **US Patent # 10,329,610**: D. Nashtaali, Seyed Abolfazl Motahari, Babak Hossein Khalaj, *"Paired-end sequencing method*", issued June 25, 2019.
3. **US Patent # 10,508,305**: Damoun Nashtaali, Seyed Abolfazl Motahari, Mehrdad Mehrbod, Babak Hossein Khalaj, Mazhareddin Taghivand, *"Sequencing and Processing*", issued December 17, 2019
4. **US Patent # 6,668,041 B2**: J. Kamali, B. H. Khalaj, *"Single Ended Line Probing in DSL System*", issued December 23, 2003
5. **US Patent # 5,513,275**: B. Khalaj, H. Aghajan, and T. Kailath, *"Automated Direct Patterned Wafer Inspection*", issued April 30, 1996

HONORS/SOCIETIES

- IEEE Tutorial Presenter: IEEE PIMRC 2022 and IEEE Globecom 2022
- Co-organizer of IEEE ICC Workshop 2022, Seoul, Korea
- Recipient of 2018 Nokia Visiting Professor Scholarship at University of Oulu
- Recipient of 2015 EU Erasmus-Mundus Visiting Professorship at TU-Berlin
- Recipient of 2007-8 Alexander von Humboldt Fellowship
- Co-editor of Spectral Compatibility Std. for ANSI T1E1.4 Technical Subcommittee, 97-99
- Contributor to ANSI T1E1.4 ADSL Issue II Technical Document, September 1998
- TPC Member of IEEE ICC, Globecom, Infocomm and PIMRC
- Reviewer for IEEE Trans. on Vehicular Technology, IEEE Trans. on Wireless Communications, IEEE Trans. on Communications, and IEEE Trans. on Signal Processing
- Ranked 1st in the National Qualifying Exam for graduate studies abroad, 1990
- Ranked 3rd in the National Undergraduate Exam (out of 200,000 applicants)