

# Mohammad Hadi

## Curriculum Vitae

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### BRIEF BIOGRAPHY

I received B.Sc. degree as a top-ranking graduate from Isfahan University of Technology, Isfahan, Iran in 2011, and M.Sc. and Ph.D. degrees with honors from Sharif University of Technology, Tehran, Iran in 2013 and 2018, respectively. I was awarded B.Sc., M.Sc., and Ph.D. scholarships from Isfahan University of Technology, Sharif University of Technology, and Iranian National Elites Foundation, respectively. As reflected in my published research papers, my main research interest covers the application of new concepts such as software-defined networking, dynamic resource allocation, and network virtualization in various networking platforms, especially optical networks. Since 2010, I have involved in various research and development projects, where I gained a lot of practical engineering experiences such as developing Linux-based software applications, real-time embedded system design, FPGA programming, and fast numerical optimization. In 2019, I joined Chalmers University of Technology, Gothenburg, Sweden as a postdoc researcher to work on power-efficient resource allocation in optical networks. I am honored to be a member of Optical/Data Networks Research Laboratory, Sharif University of Technology, and Fiber Optic Communications Research Center, Chalmers University of Technology.

### EDUCATION

- 2013 – 2018 **Doctor of Philosophy**  
GPA 18.70/20, FIRST CLASS HONORS  
Optical Communication Systems  
*Sharif University of Technology*
- 2011–2013 **Master of Science**  
GPA 18.75/20, FIRST CLASS HONORS  
Optical Communication Systems  
*Sharif University of Technology*
- 2008 – 2011 **Bachelor of Science**  
GPA 19.11/20, RANKED 1ST AMONG 144 STUDENTS  
Communication Systems  
*Isfahan University of Technology*

### AWARDS

- 2019 **Outstanding Ph.D. Thesis Award**  
*IEEE Iran Section*
- 2018 **Outstanding Ph.D. Researcher Award**  
*Sharif University of Technology*
- 2015–2017 **Ph.D. Research Assistant Award**  
*Iranian National Elites Foundation*
- 2014 **Ph.D. Teaching Assistant Award**  
*Iranian National Elites Foundation*
- 2011–2013 **M.Sc. Scholarship Award**  
*Sharif University of Technology*

- 2009–2011 **B.Sc. Scholarship Award**  
*Isfahan University of Technology*
- 2008–2011 **Top-Ranked Student Award**  
*Isfahan University of Technology*

### HONORS

- 2008–2011 **B.Sc. Student Ranking**  
Ranked 1st Among 144 Undergraduate Students  
*Isfahan University of Technology*
- 2011–2013 **M.Sc. Student Ranking**  
Ranked 6th Among 44 M.Sc. Graduate Students  
*Sharif University of Technology*
- 2013 **Ph.D. Entrance Exam Ranking**  
Ranked 4th Among All 1093 Participants  
*Nationwide University Entrance Exam*
- 2013–2018 **Ph.D. Student Ranking**  
Ranked 5th Among 38 Ph.D. Graduate Students  
*Sharif University of Technology*
- 2013–2018 **Elites Foundation Membership**  
*Iranian National Elites Foundation*

### JOURNAL PUBLICATIONS

- [1] **M. Hadi**, C. Bhar, E. Agrell, A General QoS-Aware Scheduling Procedure for Passive Optical Networks, submitted to *OSA / IEEE Journal of Optical Communications and Networking*, Aug. 2019.
- [2] **M. Hadi**, E. Agrell, Joint Power-Efficient Traffic Shaping and Service Provisioning for Metro Elastic Optical Networks, *OSA / IEEE Journal of Optical Communications and Networking*, vol. 11, no. 12, pp. 578 – 587, Dec. 2019.
- [3] **M. Hadi**, M. R. Pakravan, E. Agrell, Dynamic Resource Allocation in Metro Elastic Optical Networks Using Lyapunov Drift Optimization, *OSA / IEEE Journal of Optical Communications and Networking*, vol. 11, no. 6, pp. 250 – 259, Jun. 2019.
- [4] **M. Hadi**, M. R. Pakravan, Energy-Efficient Service Provisioning in Inter-Data Center Elastic Optical Networks, *IEEE Transactions on Green Communications and Networking*, vol. 3, no. 1, pp. 180 – 191, Mar. 2019.
- [5] **M. Hadi**, M. R. Pakravan, Energy-Efficient Transponder Configuration for Few-Mode Fiber-based Elastic Optical Networks, *IEEE Communications Letters*, vol. 22, no. 5, pp. 970 – 973, May 2018.
- [6] **M. Hadi**, M. R. Pakravan, Rate-Maximized Scheduling in Adaptive OCDMA Systems using Stochastic Optimization, *IEEE Communications Letters*, vol. 22, no. 4, pp. 728 – 731, Apr. 2018.

[7] **M. Hadi**, M. R. Pakravan, Energy-Efficient Fast Configuration of Flexible Transponders and Grooming Switches in OFDM-Based Elastic Optical Networks, *OSA / IEEE Journal of Optical Communications and Networking*, vol. 10, no. 2, pp. 90-103, Feb. 2018.

[8] **M. Hadi**, M. R. Pakravan, Resource Allocation for Elastic Optical Networks using Geometric Optimization, *OSA / IEEE Journal of Optical Communications and Networking*, vol. 9, no. 10, pp. 889-899, Oct. 2017.

[9] **M. Hadi**, M. R. Pakravan, Analysis and Design of Adaptive OCDMA Passive Optical Networks, *IEEE / OSA Journal of Lightwave Technology*, vol. 35, no. 14, pp. 2853 – 2863, Jul. 2017.

[10] **M. Hadi**, F. Marvasti, M. R. Pakravan, Dispersion Compensation using High-Positive Dispersive Optical Fibers, *Chinese Optics Letters*, vol. 15, no. 3, Mar. 2017.

[11] **M. Hadi**, M. R. Pakravan, Spectrum-Convertible BVWXC Placement in OFDM-Based Elastic Optical Networks, *IEEE Photonics Journal*, vol. 9, no. 1, pp. 1-12, Feb. 2017.

## CONFERENCE PUBLICATIONS

[1] **M. Hadi**, E. Agrell, Iterative Configuration in Elastic Optical Networks, *International Conference on Optical Network Design and Modeling (ONDM)*, May 2020.

[2] **M. Hadi**, M. M. Mojahedian, M. R. Aref, M. R. Pakravan, Time-Sharing Improves Dynamic Index Coding Delay, *Iran Workshop on Communication and Information Theory (IWCIT)*, Apr. 2019, IEEE.

[3] **M. Hadi**, M. R. Pakravan, M. M. Razavi, An Efficient Real-time Voice Activity Detection Algorithm using Teager Energy to Energy Ratio, *Iranian Conference on Electrical Engineering (ICEE)*, May 2019, IEEE.

[4] **M. Hadi**, M. R. Pakravan, Improved Routing and Spectrum Assignment Formulations for Optical OFDM Networks, *International Symposium on Telecommunications (IST)*, Sep. 2017, IEEE.

[5] **M. Hadi**, M. M. Mojahedian, M. R. Aref, Dynamic Index Coding Gain over a Complete Bi-directional Side Information Graph, *Iran Workshop on Communication and Information Theory (IWCIT)*, May 2016, IEEE.

[6] **M. Hadi**, M. M. Jahromi, H. R. Rezaei, Rainbow Table TMTO Attack Optimization Considering Online Sequential Search Time, *International Congress on Technology, Communication, and Knowledge (ICTCK)*, Nov. 2014, IEEE.

[7] **M. Hadi**, M. R. Pakravan, Adaptive Level Control to Improve QoS in OCDMA Local Area Networks, *Iranian Conference on Electrical Engineering (ICEE)*, May 2013, IEEE.

## THESES

### Ph.D. Thesis

Resource Allocation Management in Elastic Optical Networks, Supervised by Dr. M. R. Pakravan

### M.Sc. Thesis

Quality of Service Improvement in Optical CDMA Networks, Supervised by Dr. M. R. Pakravan

### B.Sc. Thesis

Structural Improvements in Single Phase Double Speed Induction Motors, Supervised by Dr. M. R. Ahmadzadeh

## PATENT

**M. Hadi**, Electronic Speed Selector Switch for Induction Motors, *Iran Intellectual Property Office*, Registration No. 78188, 2013.

## LANGUAGE SKILLS

NATIVE	Persian
FLUENT	English
FAMILIAR	Arabic

## COMPUTER SKILLS

BEGINNER	ADS, HFSS, QT, NS2, NS3, Vivado
INTERMEDIATE	OPNET, Altium Designer, ModelSim, Code::Blocks, OrCAD PSpice, PyCharm
EXPERT	Linux, Windows, L <sup>A</sup> T <sub>E</sub> X, Microsoft Office, Eclipse, Microsoft Visual Studio, ISE Mathcad, MATLAB, YALMIP Gurobi, CPLEX, CVX

## PROGRAMMING SKILLS

BEGINNER	Java, C#
INTERMEDIATE	Python, Batch Script
EXPERT	C, C++, Verilog, VHDL, Shell Script

## REFERENCES

	<b>Dr. Erik Agrell</b>
POSITION	Professor
AFFILIATION	Electrical Engineering Department <i>Chalmers University of Technology</i>
PHONE	+46 (31) 772 1762
EMAIL	agrell@chalmers.se

	<b>Dr. Mohammad R. Pakravan</b>
POSITION	Associate Professor
AFFILIATION	Electrical Engineering Department <i>Sharif University of Technology</i>
PHONE	+98 (21) 66165922
EMAIL	pakravan@sharif.edu

	<b>Dr. Jawad A. Salehi</b>
POSITION	Professor
AFFILIATION	Electrical Engineering Department <i>Sharif University of Technology</i>
PHONE	+98 (21) 6616 4346
EMAIL	jasalehi@sharif.edu

## WORK EXPERIENCES

MAR 2010 – SEP 2011 (PT)

CURRENT, FROM FEB 2019 (FT)  
**Fiber Optic Communications Research Center**  
**Postdoc Researcher**

The research in FORCE is broad in scope and covers fundamental theory as well as experiments on devices, components, systems and networks. As a post-doctoral researcher supervised by Dr. E. Agrell in FORCE, I'm working on energy-efficient resource allocation in elastic optical networks. To facilitate the research, I have developed a general simulation platform for numerical evaluation of the proposed algorithms using MATLAB, YALMIP, CPLEX, and Gubobi.

SEP 2011 – FEB 2019 (PT)

**Data Networks Research Lab**  
**Student Researcher**

The research program of DNRL includes development of new algorithms, models, architectures, communication techniques, and management schemes for next generation networks including wireless networks, sensor networks, cellular networks, and optical networks. My academic researches in DNRL are supervised by Dr. M. R. Pakravan. Focusing on resource allocation management in optical CDMA and elastic optical networks, we have published more than 14 research papers in reputable international journals and conferences. My experimental researches in DNRL deal with FPGA programming and Linux-based application development using programming languages such as Python, C, C++, and Shell scripting. I have been involved in design and development of optical CDMA systems, where I gained a lot of experiences in FPGA-based high-speed interfaces and communication modules. I also developed a native real-time network protocol stack on an FPGA platform using VHDL and Verilog languages. Moreover, I became familiar with network simulators such as NS2, NS3, and OPNET during my researches in DNRL. Furthermore, I have spent a year as a server administrator and learned a variety of settings for Linux-based services and applications such as logging tools, version control systems, project management techniques, web applications, file sharing methods, and so on.

MAY 2013 – MAR 2015 (PT)

**Electronic Research Institute**  
**Research Associate**

This position needed a broad computing and coding background across multiple programming languages and platforms, and made me an expert in developing customized Linux kernels and real-time processing over digital signal processors. Especially, I customized a light-weight Linux kernel for BeagleBoard and developed an image processing application for automatic character recognition on the customized kernel. I was also the head of a research group that built an IP camera on CubieBoard. The manufactured camera handled ONVIF SOAP control requests and used RTP, RTCP, and RTSP protocols for its video streaming. Moreover, I proposed an efficient real-time voice activity detection algorithm and experimentally validated its performance in an open-source hardware board. I also developed a C# software package for fast decoding of convolutional codes using algorithms such as Fano and Stack. As another contribution, I spent six months on design and programming of a general parallel computing system having a cluster of 128 Artix FPGAs.

**ICTI Research Institute**  
**Research Assistant**

ICTI research institute is conducting intense applied research in the areas of communications, computers, and electronics. My task in ICTI was to propose a systematic routine to model a black box using electronic elements. Especially, I designed a test bench to measure characteristic curves of an RF high power amplifier. I then used the results to provide a detailed model for the amplifier and added the model to ADS software to be used for circuit design and simulation. I also implemented DMR protocol stack on a PIC microcontroller and linked it to an SDR-based transceiver to create a wireless communication link.

## SELECTED PRESENTATIONS

How Can We Make a Simple Physical Model?, *Information and Communication Technology Institute*, 2012.

Self-Organized Networks, *Sharif University of Technology*, 2013.

A Review of Automatically Switched Optical Networks, *Sharif University of Technology*, 2014.

Hopfield Neural Networks, *Sharif University of Technology*, 2015.

Optical OFDM Networks, *Sharif University of Technology*, 2016.

Software-Defined Elastic Optical Networks, *Sharif University of Technology*, 2017.

Routing and Spectrum Assignment in Elastic Optical Networks, *Sharif University of Technology*, 2017.

Scopes for Energy-Efficiency in Optical Distribution Networks, *Chalmers University of Technology*, 2019.

Resource Allocation, A ubiquitous concept with different terminologies, *Chalmers University of Technology*, 2019.

## TEACHING EXPERIENCES

2013-2017	<b>Teacher Assistant</b> Data Communication Networks <i>Sharif University of Technology</i>
2015	<b>Teacher</b> Fourier Optics Optical Signal Processing Statistical Optical Communications <i>Islamic Azad University</i>
2015-2017	<b>Teacher</b> Digital Circuits Electromagnetism Digital Signal Processing <i>Payame Noor University</i>