CURRICULUM VITAE

Driss Benhaddou, Ph. D.
Engineering Technology Department
College of Technology
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EDUCATION:

Ph.D., Interdisciplinary in Electrical Engineering and Telecommunications Networking, *October 2002.*
University of Missouri, Kansas City, MO.
Thesis Topic: Skylight Switch: New Multicast WDM Access Switch Architecture using Photonic Fast Frequency-hopping OCDMA Technique.

Ph.D., Opto-Electronic Engineering, *April 1995.*
University of Montpellier II, Montpellier, France.
Thesis Topic: Phase Stepping Microscopy: Defects in Semiconductors and Transparent Layers.

M.S., Opto-Electronics, *July 1991.*
University of Montpellier II, Montpellier, France.
Thesis Topic: Perfection of Phase Stepping Microscopy for Studying Epitaxial Layers of Semiconductors.

B.S., Electronics, *June 1990.*
University of Abdelmalek Esaadi, Tetouan, Morocco.

CERTIFICATION:

- Certified Performance Analyst/Ethernet **(CPA/E)** from Netcom systems, 05/2000.

AWARDS AND HONORS:

- Best paper candidate in the 15th international conference on computer communications and networks, 2006 (ICCCN 2006).

- 2004 Travel award by FASEB/MARC for gransmanship training program.

- 2002 Second finalist in the VPI Systems Speed Up Photonics Award. This award attracted more than 50 participants from 15 countries, 19 universities and 5 corporations.

- 1998-99 Chancellor's Interdisciplinary Ph. D. Fellowship, University of Missouri-Kansas City.

- 1998-99 Electrical Engineering Outstanding Graduate Student Award, University of Missouri.

- 1997-98 Interdisciplinary Ph. D. Scholar Fee Remission Award, University of Missouri-Kansas City.

ACADEMIC EXPERIENCE:

08/03-Present: Assistant Professor, Engineering Technology Department, University of Houston, Houston, TX.

03/03-06/03: Adjunct Professor, Electronics Engineering Technology Department, DeVry University, Arlington, VA.

10/97-05/99: Research/Teaching Assistant, Electrical and Computer Engineering Department, University of Missouri, Kansas City, MO.

08/95- 03/97: Research Associate, Electrical and Computer Engineering Department, University of Colorado, Boulder, CO.

09/91-07/95: Research/Teaching Assistant, Centre d'Electronique de Montpellier, University of Montpellier II, Montpellier, France.

INDUSTRIAL EXPERIENCE:

09/00-08/03: Senior Member of Technical Staff (team lead), System Integration Group, Lambda Optical Systems, Inc., Reston, VA. Developing state of the art all-optical dense wavelength division multiplexing (DWDM) switching system for metro-core telecommunication infrastructure.

06/99-09/00: Network Engineer III, Consumer Technologies Laboratory, Sprint Inc., Kansas City, MO. Developed a broadband test bed for research and development, and vendor equipment certification.

05/97- 08/97: Member of Technical Staff/Summer Intern, Technology Planning and Integration, Sprint, Inc., Kansas City, MO. Object oriented modeling of telecommunications information network architecture (TINA) for Sprint's needs improvement.

TEACHING ACTIVITIES

Teaching Interests include digital communication systems, optical communications, computer networks, digital system design and Verilog HDL, Embedded systems, electronic and optoelectronic components, fiber optics, digital logics, computer design, microprocessor architecture and interfacing, client server programming.

Courses Taught
- ELET 3325: Embedded systems
- ELET 4315: Telecommunications
- ELET 4398: Optical Circuits
- ELET 6300: Computer network programming
- ELET 6314: Project management for communications
- ELET 6397: Network Routing Protocols

New Course Developed

- ELET 6397: Network routing protocols
- ELET 3325: Embedded systems
- ELET 4398: Optical circuits

Academic Development

- Contributed to the curriculum review during fall 2003 by proposing an embedded system course. This course became soon one of the core courses in computer engineering technology program.
- Collaborating with the University of Colorado on online laboratory development.
- Co-PI of the CLAB (Computer Engineering Technology Laboratory) project proposal and actively involved in the implementation of the CLAB project initiatives. The purpose of the CLAB project is to revamp the undergraduate laboratory education. New laboratory for ELET 1100 was developed during summer and fall 2004 and pilot tested during Spring 2005. The team is actively developing new laboratories for ELET 1101 and ELET 2103.

Student Mentoring
Master theses and projects guided:
1. Mark Meso, **thesis**, Performance analysis of codes used in optical code division multiple access, Spring 2004.
2. Ram Tadepalli, **project**, Frame work design and protection algorithm for waveband switched optical networks, Spring 2004.
3. Muhammed Rahman, **project**, Network security, Fall 2004.
4. Vino Zachariah, **thesis**, resource management in layer one virtual private networks (L1-VPN), Summer 2005.
5. Sergio chacon, **project,** An approach to more secure voice over Internet Protocol (VoIP) using Internet Protocol Security (IPSec), summer 2005.
6. Saheed Olajide, **project**, performance evaluation of video over IP VPN, Fall 2005.

7. Vinod Mulani, **thesis,** Optical CDMA (Electrical Engineering), expected to graduate Spring 2006.
8. Satish Dandu, **thesis,** Routing in optical networks (Computer Science), expected to graduate Spring 2006.

Masters Committee member:
1. Master thesis, committee, ET department, Veravat Wongvilaivarin, fall 2004.
2. Master thesis, committee (co-advisor with computer science department), Satish Varma.
3. Master thesis, committee (co-advisor with Electrical Engineering department), Vinod Mulani.
4. Master Thesis, committee member, ET Department, Robert Glen Escalante, Spring 2005.
5.

Professional Development

08/28/2006-08/31/2006: Participated in OPNETwork 2006 conference and technical training on the OPNET simulation software.

04/07/2004: Participated in a presentation at the Hilton Hotel on teaching strategies for special populations. Dr. Julie Padgett of the University of Arizona has been instrumental in developing some teaching strategies in cooperation with the University of Houston. UH is a part of a grant award that she represents and from which she intends to report to our faculty.

09/16/2004-09/18/2004: Participated in the workshop in excellence in teaching program (ExcEEd).

10/23/2004-10/24/2004: ETLI conference, moderator assistant for the session "ReEngineering Engineering Technology for Faculty - Part 4 Increasing Importance of Publications for Engineering Technology Faculty"

RESEARCH ACTIVITIES

Dr. Benhaddou's areas of expertise include optical networking, sensor networks, switching system design, routing protocols, performance analysis, and optical instrument development for defect recognition of semiconductors. He is an expert in the area of multi-protocol internetworking (SONET, ATM, IP, optical) and also has a solid background in software development with applications in routing/signaling protocols and network simulation.

During his first Ph. D. to the mid 90's his research effort was concentrated on defect recognition for semiconductors using optical instruments and image processing resulting in journal publications and conference proceedings. During his post-doc tenure at the University of Colorado he built a laser scanning tomography (LST) instrument to investigate defects in Lithium Niobate. He was working on a project funded in part by the Air Force Office of Scientific Research (AFOSR) and the United States Missile Command in cooperation with the Defense Advanced Research Projects Research Administration (DARPA). Recently, he started collaborative efforts with Dr. Abdelhak Bensaoula at the TcSAM center to implement laser scanning tomography and phase stepping microscope to investigate defects in III-Nitride materials. This effort resulted in submitting two proposals to NSF and DoD.

Recently, Dr. Benhaddou's area of research focused more on optical networking and optical switching design resulting in a second Ph. D. from the University of Missouri. During his earlier tenure at Sprint, Dr. Benhaddou implemented an extensive broadband test-bed for vendor equipment certification and research/development activities. This experience gave him detailed practical knowledge about the deployment, operation, and interoperability of differing network technologies. Additionally, he also helped develop hierarchical PNNI routing solutions for ATM networks along with interconnection strategies for packet-over-SONET networks.

Subsequently, Dr. Benhaddou was a senior technical staff member at Lambda Optical Systems Inc, where he played a key role in protocol development and systems integration activities. In particular, he was leading system integration for an OSPF routing and signaling implementation for GMPLS-based optical domains and proposed various protocol extensions. Additionally, Dr. Benhaddou headed system test/integration activities for the *Advanced Technology Demonstration Network* (ATDNet) test-bed project and worked closely with the *Naval Research Laboratory* (NRL) and *Laboratory for Telecommunication Sciences* (LTS) at the *National Security Agency* (NSA). Overall, this comprehensive background has given Dr. Benhaddou a solid understanding of many of the theoretical and practical aspects of optical network and protocol design/deployment.

Dr. Benhaddou is spearheading the development of a new state-of-the-art networking research laboratory within the department using a start up and GEAR grants from UH. His work is also supported by Sprint and SBC grants.

In addition, he is actively involved in research in education where he is developing remote laboratories for optical circuits in collaboration with Dr. Deniz Gurkan and Prof. Alan Mickelson at the University of Colorado. His work was recently supported by an FDIP grant for Fall 2005, the International Society for Optical Engineering grant, and NSF (DUE-0536823).

Funded Proposals ($1.17 M)

I. **University of Houston**, Start up grant, Fall 2003, *Optical Networking research lab (ONRL)- phase I.* ($102,700)
PI: Driss Benhaddou

II. **Grants to Enhance and Advance Research (GEAR),** University of Houston, 9/2004-8/2005. "*Application of Optical Code Division Multiple Access (OCDMA) in high-speed optical switching systems*". The purpose of this project is to investigate a potential application of OCDMA in backplane and switching systems for high speed communications networks ($18,200.00).
PI: Driss Benhaddou

III. **SPRINT,** 4/04-4/05, "*Unified End-to-End Provisioning in Multi-Domain Metro-Core Networks*". The purpose of this project is to perform comparative analysis of different optical network control plane architectures for Sprint networks ($112,812.00).
PI: D. Benhaddou
Co-PI: Nasir Ghani (TN Tech. University)

IV. **Southwestern Bell Corp. (SBC)**, Fall 2005, "*COT/SBC technology alliance*" ($250,000).
PI: D. Benhaddou
Co-PI: S. Chacon, D. Gurkan, X. Yuan, J. Lustberg

V. **The International Society for Optical Engineering**, 2005, *Educational Grant in Optical Science and Engineering* ($2,000).
PI: D. Gurkan
Co-PI: D. Benhaddou,

VI. **FDIP**, University of Houston, fall 2005, *Distributed Online Laboratory Instruction for Optical Communication Circuits Courses* ($4,000).
PI: D. Benhaddou
Co-PI: D. Gurkan,

VII. **NSF (DUE-0536823)**, "*Collaborative Research: An Online Laboratory for optical Circuits Courses*" ($125,000)
PI: Driss Benhaddou
Co-PI: Deniz Gurkan, Alan Mickelson (University of Colorado), and Zhongqi Pan (University of Louisiana)

VIII. **ILX Lightwave (instrument grant)**, 2006, Laser Instrument for remote optical circuits laboratory ($10,000).
PI: D. Gurkan
Co-PI: D. Benhaddou

IX. **GEAR**, 1/31/06, "An Affordable Personalized Chronic Illness Management System Based on a Distributed Biomedical Sensor Network" ($60,000)
PI: Xiaojing Yuan
Co-PI: Deniz Gurkan and Driss Benhaddou

X. **NASA**, "Intelligent Sensor Network Testbed for ISHM" ($493,000)
PI: Deniz Gurkan
Co-PI: Xiaojing Yuan, and Driss Benhaddou

Research laboratory

Optical Networking Research Lab is being set up using the start up fund.

Publications

JOURNAL PUBLICATIONS

1. N. Ghani, V. M. Muthalaly, D. Benhaddou, W. Alanqar, "Layer 1 VPN Services in Distributed Next-Generation SONET/SDH Networks With Inverse Multiplexing," *OSA Journal of Optical Networking*, Vol. 5, No. 5, pp. 367-382, May 2006.

2. D. Benhaddou, G. Chaudhry, and R. J. Runser, "Design and scalability analysis of a fast-frequency-hopping optical CDMA switch architecture," OSA *Journal of Optical Networking,* Vol. 3**,** pp. 694-706, 2004. Available: http://www.osa-jon.org/abstract.cfm?URI=JON-3-9-694

3. Driss Benhaddou and Ghulam Chaudhry, "Photonic Switching Techniques and Architecture for Next Generation Optical Networks," Cluster Computing (CLUS) Vol. 7, No. 3, pp. 281-291, 2004.

4. D. Benhaddou, P. C. Montgomery, D. Montaner and J. Bonnafe, "Burred interface characterization in optoelectronic materials by interference microscopy," *Journal of Modern Optics,* vol. 48, No. 3, pp 533-547, 2001.

5. P. Montgomery, D. Benhaddou and D. Montaner, "Interferometric roughness measurement of ohmic contact/III-V semiconductor interfaces," *Applied Physics Letters*, vol. 71, No. 13, pp 1768-1770, 1997.

6. O. Perrot, D. Benhaddou, P. C. Montgomery, R. Rimet, B. Boulard and C. Jacoboni, "Optical investigation of PZG glass waveguide by vapor phase deposition," *J. Non Crys. Solids*., vol. 184, pp. 257-262, 1994.

CONFERENCE PROCEEDINGS

1. M. Anan, G. Chaudhry, and D. Benhaddou "Promises and Challenges of Optical Burst Switching (OBS) for Next-Generation Optical Networks," 2006 GLOBECOM, San Francisco, CA., USA, Nov. 27-Dec. 1, 2006.

2. D. Benhaddou, N. Ghani, W. Alanqar, S. Dandu, K. Amimireddygari, and V. Zakariah, "Performance evaluation of resource management models in Layer 1 VPN Services in multi-domain hierarchical networks," *IEEE ICCCN 2006 proceedings*, Arlington, Virginia, USA, Oct. 9-11, 2006 (made it to the best paper candidate list).

3. M. Anan, G. Chaudhry, and D. Benhaddou "Architecture and Performance of A Next-Generation Optical Burst Switch (OBS)," 2006 International Workshop on Optical Burst/Packet Switching (WOBS) West (In conjunction with IEEE/CreateNet BROADNETS 2006), San Jose, CA., USA, Oct. 2nd, 2006.

4. N. Ghani, D. Benhaddou, W. Alanqar, "Performance of Dynamic Shared Layer 1 VPN Services in Next-Generation SONET/SDH Networks," in *2006 IEEE International Conference on Communications (ICC 2006)*, Turkey, June 2006.

5. Driss Benhaddou, Deniz Gurkan, Harshita Kodali, Ed McKenna, Alan Mickelson and Frank Barnes "Online Laboratory for Optical Circuits Courses: Effective Concept Mapping," *Proceedings of the 2005 ASEE Gulf-Southwest Annual Conference,* Baton Rouge-LA, 2006.

6. F. Attarzadeh, D. Benhaddou, D. Gurkan and R. Khalili, "Innovative Improvements to Engineering Technology Laboratory Education to Engage, Retain and Challenge Students of the 21st Century," *Proceedings of the 2005 ASEE Gulf-Southwest Annual Conference,* Baton Rouge-LA, 2006.

7. need to add the publication with Deniz and Attarzadeh…

8. Sergio Chacón, Driss Benhaddou and Deniz Gurkan, "Experimental Design of a Laboratory for Voice Over IP using SIP," *Proceedings of the 2005 ASEE Gulf-Southwest Annual Conference,* Baton Rouge-LA, 2006.

9. Cheryl Willis, Susan Miertschin, and Driss Benhaddou, "Instructional Uses of Tablet PC's in STEM Learning Environments," *Proceedings of the 2005 ASEE Gulf-Southwest Annual Conference,* Baton Rouge-LA, 2006.

10. N. Ghani, D. Benhaddou, W. Alanqar, K. Amimireddygari, S. Dandu, "Dynamic Shared Layer 1 VPN Provisioning in Next-Generation SONET/SDH Networks," in *Proceeding of the 14th International Conference on Computer Communications and Networks (IEEE IC3N'05),* San Diego, 2005, pp. 549-554.

11. Edward McKenna, Randal Direen, Frank Barnes, Deniz Gurkan, Alan Mickelson, and Driss Benhaddou, "E-learning Environmental Design of a Distributed Online Laboratory for Optical Circuits Courses," in *Proceedings of the 2005 American Society for Engineering Education Annual Conference & Exposition (ASEE'05),* Portland-OR, 2005.

12. N. Ghani, C. Assi, A. Shami, M. Ali, D. Benhaddou, "Inverse-Multiplexing in Multi-Layer Optical Grooming Networks," in *Proceeding of the IEEE/Sarnoff Symposium on Advances in Wired and Wireless Communication*, Princeton-NJ, 2004, pp 75-78.

13. D. Benhaddou and G. Chaudhry, "Fiber Bragg Grating based Fast frequency-hopping optical CDMA switching to access WDM networks," in *the 6th World Multiconference on Systemics, Cybernetics and Informatics,* Orlando-FL, 2002, Vol. X, pp 590-595.

14. D. Benhaddou, A. I. Alfuqaha, G. Chaudhry, "New Multiprotocol WDM/CDMA-Based Optical Switch Architecture," in *Proceedings of the 34th annual Simulation Symposium*, 2001, pp. 285-291.

15. M. Guizani and D. Benhaddou, "Design of ATM Switch Architectures using Optical Systems," in *Proceedings of the International Conference of Parallel and Distributed Processing and Applications (PDPTA'99),* pp. 2463-2469, June 1999.

16. Alfuqaha, D. Benhaddou, M. Guizani, and M. Chaudhry, "Design and simulation of a New Fault-Tolerant multicasting ATM Switch," in *Proceedings of the Symposium on Performance Evaluation of Computer and Telecommunication Systems (SPECTS'98)*, 1998, Reno-NV, pp. 67-70.

17. D. Benhaddou and A. R. Mickelson, "Laser scanning tomography studies of Lithium Niobate crystals," in *Proceedings of the Defect recognition and Image Processing in Semiconductors and Devices conference*, Boulder-CO, 1995, pp. 139-142.

18. P. C. Montgomery, J-M Lussert, P. Vabre and D. Benhaddou, "Super-resolution 3D optical imaging of semiconductors using coherent microscopy," in *Proceedings of Three Dimensional Microscopy: image acquisition and processing II (SPIE),* Ed A. Wilson, vol. 2412, 1995.

19. P. C. Montgomery, D. Montaner, D. Benhaddou, P. Vabre, "Characterization of relief of semiconductor surface using digital interference microscopy," In *Proceedings of the Defect Recognition and Image Processing in Semiconductors and Devices conference*, Santader, Spain, 1993.

PRESENTATION

1. R. Tadepalli and D. Benhaddou, "Framework Design And Protection Algorithm For Waveband-Switched Optical Networks," *poster presented in research and scholarship day 2004*, organized by the university of Houston.
2. V. Mulani and D. Benhaddou, "Fiber Optic Code Division Multiple Access based Switch Design," *poster presented in research and scholarship day 2005*, organized by the university of Houston.
3. S. Dandu and D. Benhaddou, "Dynamic K-optimal path computation algorithms in optical multi-domain networks" *poster presented in research and scholarship day 2005*, organized by the university of Houston.
4. D. Benhaddou and D. Gurkan, "online laboratory for optical circuits," experiment and poster presentation in UH research day 2006 to show how students can conduct online experiment.
5. Sergio, Driss, and Deniz, "voice over Internet Protocol (VOIP): security issue," experiment presentation in UH research day 2006 to demonstrate VOIP technology.
6. D. Benhaddou, "performance evaluation of dynamic multidomain routing protocol in optical networks", oral presentation in LEARN meeting.

THESES AND DISSERTATION

7. D. Benhaddou, "Skylight Switch: New multicast WDM access switch architecture using photonic fast frequency-hopping OCDMA technique," Ph. D. diss., University of Missouri-Kansas City, 2002.

8. D. Benhaddou, "Phase Stepping Microscopy: Defects in Semiconductors and Transparent Layers," Ph. D. diss., University of Montpellier II, France, 1995.

9. D. Benhaddou, "Perfection of Phase Stepping Microscopy for Studying Epitaxial Layers of Semiconductors," Master's thesis, University Montpellier II, France, 1991.

TECHNICAL REPORTS

10. Driss Benhaddou, "Application of Optical Code Division Multiple Access (OCDMA) in high-speed optical switching systems," University of Houston, GEAR proposal report, Jan. 2006.

11. Driss Benhaddou, "Optical Networking Research Laboratory," University of Houston, College of Technology start up fund report, Aug. 2005.

12. Nasir Ghani, Driss Benhaddou, and Wesam Al-Anquar, "Value-Added Proposition for Optical Services: a Mutli-Domain OSS/Control Plane Perspective," University of Houston, Quarterly Progress report, Jul. 2004.

13. Nasir Ghani, Driss Benhaddou, and Wesam Al-Anquar, "Value-Added Proposition for Optical Services: a Mutli-Domain OSS/Control Plane Perspective," University of Houston, Quarterly Progress report, Sept. 2004.

14. Nasir Ghani, Driss Benhaddou, and Wesam Al-Anquar, "Value-Added Proposition for Optical Services: a Mutli-Domain OSS/Control Plane Perspective," University of Houston, Quarterly Progress report, Nov. 2004.

15. Nasir Ghani, Driss Benhaddou, and Wesam Al-Anquar, "Value-Added Proposition for Optical Services: a Mutli-Domain OSS/Control Plane Perspective," University of Houston, Quarterly Progress report, December. 2004.

16. Technical Reports for CNET France, Littons inc., Sprint Telecommunication inc. and Fistwave Intelligent Optical Networks inc.

Professional development
09/24/04: Participated in the intellectual property seminar organized by the DOR
10/01/04: Participated in the COT seminar on research organized by the DOR
11/04/04-11/06/04: Participated in the grantsmanship training program in Tucson, Arizona.

SERVICE ACTIVITIES

1. DAC committee member: reviewed the bylaws. Met more than 3 times a year.
2. New faculty search Committee, Fall 2003
3. ASC faculty advisor 2003-Current.
4. IEEE COT student chapter advisor: motivated IEEE student officers to increase student joining IEEE. Won the first student chapter that increased most on student enrollment (2006). Organized a list of series on VOIP by Sergio and people from Nortel.
5. Library liaison for Engineering Technology, 2003-2005.
6. Technical Program Committee member of OptiComm conference (2003).
7. Technical Program Committee member of IEEE International Conference on Communications, ICC 2005
8. International Program Committee (IPC) member for the International Association of Science and Technology for Development (IASTED) international conference on optical communication systems and networks (OCSN 2006).
9. Reviewer of IEEE Communication letters.
10. Reviewer for ASEE national conference 2004.
11. Reviewer for InfoCom.
12. Member, IEEE Communications Society, 1997- present.
13. Member Optical Society of America (OSA), 1997-present.
14. Member of American Society of Engineering Education (ASEE), 2004-present.
15. TPC member Globecom'06-ATPON
16. TPC member
17. Member of T&P committee to review promotion of different levels of faculty (Spring 2006, Fall 2006 (may be)
18. University Graduate Committee (start Fall 2006)
19. TPC member for 2007 IEEE Wireless Communications & Networking Conference (WCNC 2007).
20. TPC member for 2007 IEEE International Conference on Communications (ICC 2007-CCN).
21. The technical program committee for ICC 2007 CCN (ICC 2007 Computer and Communications Network Security Symposium).
22. Member of the Biotechnology Academic Advisory Committee (since Fall 2006)

Professional development
03/24/04, Participated in *"Faculty Referrals: Minefield or Opportunity,"* seminar Organized by the University career services.