SYED MUHAMMAD BILAL

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EDUCATION

•	Feb. 2012 – Feb. 2015	PhD Elect. & Telecomm. Engineering	Politecnico di Torino, Italy
•	Mar. 2009 – Jan. 2011	MSc Electrical Engineering (3.79 / 4.00 CGPA)	University of Engineering and Technology, Taxila
•	Oct. 2004 – Sept. 2008	BSc Electrical Engineering (A+ Grade, 84.7%)	University of Engineering and Technology, Taxila

PhD THESIS

• Design of Ad-Hoc Algorithms for Performance Optimization of High-Order Modulation Formats in Coherent Optical Transmission Systems

Focused on **Carrier Phase Estimation** (CPE) and Compensation algorithms, **Blind Modulation Format Identification** (MFI) for coherent optical systems and **Automatic Bias Control** of Mach-Zehnder Modulators.

<u>MSc THESIS</u>

• Simulation of EDFA/RAMAN Hybrid Amplifier achieving Gain Flattening for Long Haul DWDM Systems.

FINAL YEAR BSc ENGINEERING PROJECT

• Implementation of AM, FM and OFDM modules of Software Defined Radio (SDR) on USRP Board.

SELECTED PUBLICATIONS

- S. M. Bilal, G. Bosco, Z. Dong, A. P. T. Lau, C. Lu, "Blind Modulation Format Identification for Digital Coherent Receivers," *Optics Express*, September 2015 (accepted), .
- S. Abrate, A. Nespola, L. Bertignono, G. Bosco, A. Carena, Y. Jiang, S. M. Bilal, P. Poggioilni, F. Forghieri, "Experimental Demonstration of Fiber Nonlinearity Mitigation in a WDM Multi-Subcarrier Coherent Optical System," *in Proc. of ECOC 2015, Valencia (Spain)*, September 2015 (accepted).
- J. Cheng, M. Tang, A. P. T. Lau, C. Lu, L. Wang, Z. Dong, S. M. Bilal, S. Fu, P. P. Shum, D. Liu "Pump RIN-induced impairments in unrepeatered transmission systems using distributed Raman amplifier," *Optics Express*, vol. 23, no. 9. pp. 11838 11854.
- S. M. Bilal, G. Bosco, J. Cheng, A. P. T. Lau, C. Lu, "Carrier Phase Estimation through the Rotation Algorithm for 64-QAM Optical Signals," *Lightwave Technology, Journal of*, vol. 33, no. 9, pp. 1766 1773.
- S. M. Bilal, G. Bosco, J. Cheng, A. P. T. Lau, C. Lu, "Performance and Complexity Comparison of CPE Algorithms for 256-QAM Optical Signals," *in Proc. of OFC/NFOEC 2015, Los Angles,* paper W1E.6, March 2015.
- S. M. Bilal, K. P. Zhong, J. Cheng, A. P. T. Lau, G. Bosco, C. Lu, "Performance and Complexity Comparison of Carrier Phase Estimation Algorithms for DP-64-QAM Optical Signals," *in Proc. of ECOC 2014, Cannes (France),* paper P.3.11, September 2014.
- S. M. Bilal, G. Bosco, A. P. T. Lau, C. Lu, "Linewidth-tolerant Feed-forward Dual-stage CPE Algorithm Based on 64-QAM Constellation Partitioning," *in Proc. of ECOC 2014, Cannes (France)*, paper P.3.24, September 2014.
- S. M. Bilal, C. R. Fludger, G. Bosco, "Multi-Stage CPE Algorithms for 64-QAM Constellations," *in Proc. of OFC/NFOEC 2014, San Francesco,* paper M2A.8, March 2014.
- S. M. Bilal, V. Curri, C. Fludger and G. Bosco, "Multi-stage CPE algorithms for phase noise mitigation in 64-QAM optical systems," *Lightwave Technology, Journal of*, vol. 32, no. 17, pp. 2973 2980.

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- S. M. Bilal and G. Bosco, "Automatic bias control of Mach-Zehnder modulators for QPSK and QAM systems," *Optical Technology*, *Journal of*, vol. 81, no. 7, pp. 403 407.
- S. M. Bilal, G. Bosco, P. Poggiolini, and C. Fludger, "Low-complexity linewidth-tolerant carrier phase estimation for 64-QAM systems based on constellation transformation," *in Proc. of ECOC 2013, London (United Kingdom)*, paper P.3.7, September 2013.
- S. M. Bilal and G. Bosco, "Dual stage carrier phase estimation for 16-QAM systems based on a modified QPSK-partitioning algorithm," *in Proc. of ICTON 2013, Cartagena (Spain),* paper We.D1.2, June 2013.
- S. M. Bilal, A. Carena, C. Fludger and G. Bosco, "Dual stage CPE for 64-QAM optical systems based on a modified QPSK-partitioning algorithm," *Photonics Technology Letters, IEEE*, vol. 26, no. 3, pp. 267 270.

I am also serving as a reviewer for some major international Journals like IEEE Photonics Technology Letters (PTL), Journal of Lightwave Technology (JLT), Optics Communications etc.

EXPERIENCE

- (Feb 2015- to date) Post Doc. Researcher, OptCom Politecnico di Torino
 Working on "Offset QAM (OQAM), Joint Carrier Phase Estimation (CPE) Schemes for Multi-Subcarrier Coherent
 Ontical Systems" under the supervision of Prof. Gebriella Posco
- **Optical Systems**", under the supervision of Prof. Gabriella Bosco.
- (Mar 2014- Sep 2014) **Research Asst.**, Photon. Research Centre The Hong Kong Polytechnic University. Project Title: Towards Practical Deployment of Dynamic Coherent Optical Networks

Worked on "Blind Modulation Format Identification (MFI) for Coherent Optical Systems", under the supervision of Prof. Alan Pak Tao Lau and Prof. Chao Lu.

- (Jan 2013- March 2014) PhD Researcher in a SRA project Funded by Cisco Photonics.
 Project Title: BROADTECH Broad Utilization Envelope Low-Consumption Coherent Transmission Technologies.
 Worked on "CPE Algorithms for High-Order Modulation Formats in Coherent Optical Systems", in cooperation with Cisco Optical GmbH Nürnberg, Germany
- (Dec 2012- Nov 2013) **PhD Researcher** at ISMB Istituto Superiore Mario Boella (ISMB). Worked on **"Automatic Bias Control of Mach Zehnder Modulators"** under the supervision of Dr Antonino Nespola.
- (Dec 2008- Feb 2012)
 (Apr- May 2008)
 Lecturer in Electrical Engg. Dpt.
 University of Engg & Technology, Taxila.
 Warid Telecom Pvt Limited, Islamabad.

TAUGHT COURSES

- EE-207: Modern Electronics
- EE-422: Microwave Devices
- CS-100: Introduction To Computers
- EE-111: Linear Circuit Analysis

TAUGHT LABS

- EE-423: Digital Image Processing
- EE-111: Linear Circuit Analysis

TECHNICAL SKILLS

Softwares: Matlab, OptSim, OptiSystem, VPI, PSPice Circuit Simulator, Modelsim, Protius Professional, Map Info Professional ,Tems Investigate, Tems Auto, Keil Uvision2, Auto Cad, Microsoft Visio, Express PCB. *Languages:* C/C++ Object Oriented Programming, Verilog HDL, Assembly.

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AWARDS AND ACHIEVEMENTS

- Won Higher Education Commission scholarship for PhD (2012).
- Certificate of Merit in MSc Electrical Engineering (2011).
- Among the **Top Five** Students of BSc Electrical Engineering and have done it with Honors (2008).
- Distinction in College Board Exams (Shield Awarded By College) in 2004.
- Distinction and **2nd Position** in School in Matriculation Exams (2002).
- Remain on Top Position from 1st Grade to 9th Grade.
- 2nd Position in All Pakistan Debates at Secondary Level (1998)
- Member of Young Speakers Society at School.

PROFESSIONAL MEMBERSHIPS

- Member Pakistan Engineering Council (PEC).
- Member IEEE.