Omer Gokalp MEMIS, Ph.D.

Citizenship: Dual Citizen – USA and Turkey
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EDUCATION

09/05-03/10:	Ph.D., Electrical Eng. and Computer Sci., Northwestern Uni., Evanston, IL	4.00 / 4.00
09/03-07/05:	M.Sc., Electrical and Electronics Engineering, Bilkent Uni., Ankara, Turkey	4.00 / 4.00
09/99-07/03:	B.Sc., Electrical and Electronics Engineering, Bilkent Uni, Ankara, Turkey	3.87/ 4.00

TECHNICAL SKILLS

Operational:	Staff management, project management, risk assessment and mitigation, manufacturing tactical operations, strategic capacity planning
Data analytics:	Scikit, NumPy/Pandas, Tensorflow, JMP, SQL, MATLAB
Programming:	Python, JMP scripting/UI, Matlab scripting, VBS, Java, C/C++
Measurement:	Bright- and dark-field microscopy, opto-/electro- induced IV measurements, high-speed/RF measurements (spectrum analyzers, OTDR, TDR/TDT, VNA, lock-in, femtosecond), SEM, AFM, FTIR, biomedical (MRI, OCT)
Fabrication:	Silicon processing flow, process node development, high volume manufacturing, statistical process control, failure mode & effects analysis, nanotechnology, metamaterials
Software:	Klayout, Comsol Multiphysics, Lumerical, Silvaco, Pspice, L-Edit, Labview,. Windows, Linux, Microsoft Office.

WORK EXPERIENCE

04/2018 – Present: **Intel Corp,** Defect Metrology / Yield Group Leader

Unpatterned optical, Layout-aware CD/review SEM and X-ray fleet Group Leader

- Group leader for 10+ fleets of unpatterned optical tools, review SEMs and X-ray tools.
- Data scientist for multi-source and multi-database data augmentation and analysis, automated visualization and reporting.
- Developed and deployed unsupervised machine learning programs for layout-aware detection with a scalable structure for massive review datasets.
- Point of contact for module particle monitoring, and inline monitoring/reviewing for applicable segments.
- Responsible for next-gen tool development and deployment in preparation to HVM transfer
- Responsible sustaining of current-gen tools to meet the needed 24/7 manufacturing availability, utilization and other operational needs.
- Managed 10+ people team of PhDs, MScs and BScs.

11/2013 – 04/2018: **Intel Corp,** Defect Metrology Tool Owner / Data Scientist

Unpatterned optical tool owner, Layout-aware SEM tool owner

- Tool owner responsible for unpatterned optical tools and layout-aware review SEMs.
- Handled sustaining, recipe work, preventative maintenance and on-call for the respective fleets.
- Worked with various stakeholders to define problem statements and work out tool/recipe solutions.

03/2010 – 10/2013: **Northwestern University,** Post-Doctoral Fellow
09/2005 – 03/2010: **Northwestern University**, Research Assistant

Novel Bio-inspired Nano-Injection Single Photon Detectors and Imagers.

- Led the design, modeling, fabrication and automated custom bench testing of the novel detector and arrays.

- Highest reported stable gain values in detectors (10k+), ultra low noise levels, lowest reported jitter (<14ps).
- Manufactured novel SWIR imagers with extremely high sensitivity (28e- noise at 2000 frames/s).
- *Secondary Research Projects* involve Plasmonic Nanoantennas on QCLs, OEM Photon Detectors, Tunable QWIP, Fiber-Optic Biosensors and Fiber-Optic Based Tunable Filters.

06/2007 – 07/2007: **Fermilab,** Intern

Silicon Based Vertex Detector Simulation Using Silvaco.

- Improved the quantum efficiency and pixel isolation by optimizing the vertex detector structure parameters.
- Developed 2-D and 3-D models for a silicon based vertex detector for the Tevatron particle accelerator.

09/2004 – 07/2005: **Bilkent University**, Research Assistant

Design and Construction of "Ultra-low Noise Optical Transmission System for MRI Signals".

- Designed and built ultra-low noise amplifiers and an electro-optic transmitter for interventional parallel imaging. Custom built components to fit MRI specifications. Verified in situ with an MRI scanner.

06/2001-07/2001: **Mobilsoft Inc**, Intern

Summer internship on "Web-Based Distance Learning Software": Increased the speed of the audiovisual multicasting module more than 200% through algorithm optimization and compression improvement.

06/2000-07/2000: **ASELSAN Inc**, Intern

Summer internship at ASELSAN Inc: Built a sample-and-hold amplifier using surface mount components.

AWARDS & HONORS

10/2011:	Awarded "International Institute of Nanotechnology Outstanding Research"
06/2010:	Awarded "Best PhD Dissertation" by the EECS Department at the Northwestern Uni.
07/2009:	Awarded McCormick School of Engineering Terminal Year Fellowship by Northwestern Uni.
12/2007:	Awarded Ryan Fellowship by Northwestern University to pursue research in Nanotechnology.
03/2005:	Awarded Walter P. Murphy Fellowship by Northwestern Un, Full Scholarships by Stanford and Johns Hopkins Universities.
12/2004:	Ranked 1st among graduate students in the Bilkent University Electrical and Electronics Eng.
09/2003 - 07/2005:	Full Graduate Scholarship by Bilkent University.
06/2003:	Ranked 6th among the B.Sc. graduates of Bilkent University Electrical and Electronics Eng.
01/ 2003:	Ranked 12th / 50,000 in nation-wide Graduate Education Examination (Equivalent of GRE)
07/1999 - 07/2003:	Full Undergraduate Scholarship by Bilkent University
06/1999**:**	Ranked 42nd / 1,500,000 in the National University Election and Placement Examination

COMMUNICATION SKILLS

Language: English (Fluent), Turkish (Native), German (Beginner)

PATENTS

1) H. Mohseni and **O.G. Memis**, US Patent #9,054,247 "Sing-photon nano-injection detectors" 2015.

BOOK CHAPTERS

2) H. Mohseni and **O.G. Memis**, "Nano-Injection Photon Detectors for Sensitive, Efficient Infrared Photon Detection and Counting", a chapter of VLSI Micro- and Nanophotonics: Science, Technology, and Applications, edited by E.-H. Lee, L. Eldada, M. Razeghi, C. Jagadish, CRC Press 2010.
3) **O.G. Memis** and H. Mohseni, "Nano-Injection Detectors and Imagers for Sensitive and Efficient Infrared Detection", a chapter of Information Optics and Photonics: Algorithms, Systems, and Applications, edited by T. Fournel (Editor), B. Javidi, Springer (2010).
4) **O.G. Memis** and H.Mohseni, "Design of the Nano-injection Detectors using Finite-Element-Modeling", a chapter of Computational Finite Element Methods in Nanotechnology, edited by S. M. Musa, CRC Press (2012)

JOURNAL PAPERS

1) J. Kohoutek, D. Dey, A. Bonakdar, R. Gelfand, V. Fathipour, **O. G. Memis**, H. Mohseni, "Mechanical frequency and amplitude modulation of quantum cascade laser integrated with plasmonic nanoantenna", *Small* 8, 3781 (2012).
2) J. Kohoutek, A. Bonakdar, R. Gelfand, D. Dey, I. Hassani, V. Fathipour, **O. G. Memis**, and H. Mohseni, "Integrated all-optical Infrared Switchable Plasmonic Quantum Cascade Laser", *Nano Letters* 12, 2537 (2012).
3) J. Kohoutek, D. Dey, A. Bonakdar, R. Gelfand, A. Sklar, **O.G. Memis,** H. Mohseni, "Opto-Mechanical Force Mapping of Deep Subwavelength Plasmonic Modes", *Nano Letters* 11(8), 3378-3382 (2011).
4) **O. G. Memis,** J. Kohoutek, W. Wu, R. M. Gelfand, H. Mohseni, "A Short-Wave Infrared Nano-Injection Imager with 2,500 A/W Responsivity and Low Excess Noise", *IEEE Photonics Journal* 2(5), 858 (2010).
5) **O. G. Memis,** J. Kohoutek, W. Wu, R. M. Gelfand, H. Mohseni, "Signal-to-noise performance of a short-wave infrared nanoinjection imager", *Optics Letters* 35 (16), 2699 (2010)
6) J. Kohoutek, I. Y. L. Wan, **O. G. Memis,** and H. Mohseni "An opto-electro-mechanical infrared photon detector with high internal gain at room temperature" *Optics Express* 17 (17), 14458, (2009).
7) W. Wu, D. Dey, **O. G. Memis,** and H. Mohseni, "Modeling and fabrication of electrically tunable quantum dot intersubband devices", *Applied Physics Letters*, 94, 193113, (2009).
8) D. Dey, W. Wu, **O. G. Memis,** H.Mohseni,"Injectorless quantum cascade laser with low voltage defect and improved thermal performance grown by metal-organic chemical-vapor deposition", *Appl. Phys. Lett.* 94, 081109 (2009).
9) W. Wu, D. Dey, **O. G. Memis,** A. Katsnelson, and H. Mohseni, "Fabrication of Large Area Periodic Nanostructures Using Nanosphere Photolithography", *Nanoscale Research Letters*, 3, 351 (2008)
10) **O.G. Memis,** A. Katsnelson, H. Mohseni, M. Yan, S. Zhang, T. Hossain, N. Jin, I. Adesida, "On the Source of Jitter in a Room-Temperature Nanoinjection Photon Detector at 1.55 µm", *IEEE Electron Device Lett*, 29(8), 867 (2008)
11) W. Wu, D. Dey, A. Katsnelson, **O. G. Memis,** and H. Mohseni, "Large areas of periodic nano-holes perforated in multi-stacked films produced by lift-off", *Journal of Vacuum Science and Technology* B, 26 (5), 1745 (2008)
12) **O.G. Memis,** A. Katsnelson, S. C. Kong, H. Mohseni, M. Yan, S. Zhang, T. Hossain, N. Jin, and I. Adesida, "Sub-Poissonian Shot Noise of a High Internal Gain Injection Photon Detector", *Optics Express*, 16(17), 12701, (2008).
13) **O. G. Memis**, Y. Eryaman, O. Aytur, and E. Atalar, "Miniaturized Fiber-Optic Transmission System for MRI Signals," *Magnetic Resonance in Medicine*. 59, 165 (2008)
14) W. Wu, D. Dey, **O. G. Memis,** A. Katsnelson and H. Mohseni, "A Novel Self-aligned and Maskless Process for Formation of Highly Uniform Arrays of Nanoholes and Nanopillars", *Nanoscale Research Letters*, 3(3), 123 (2007).
15) W. Wu, A. Katsnelson, **O. G. Memis,** and H. Mohseni, "A deep sub-wavelength process for the formation of highly uniform arrays of nanoholes and nanopillars", *Nanotechnology*, 18, 485302 (2007)
16) **O. G. Memis,** A. Katsnelson, S.-C. Kong, H. Mohseni, M. Yan, S. Zhang, T. Hossain, N. Jin, and I.Adesida, "A photon detector with very high gain at low bias and at room temperature," *Appl. Phys. Lett.* 91, 171112 (2007)

CONFERENCE PAPERS

1) I. Hassani, **O.G. Memis**, J. Kohoutek, R. Gelfand, H. Mohseni, “Surface plasmon enhancement of photon extraction efficiency by silver nanoparticles: with applications in laser cooling of semiconductors,” SPIE Optics+Photonics (2012).
2) J. Kohoutek, D. Dey, A. Bonakdar, R. Gelfand, V. Fathipour, **O. G. Memis**, H. Mohseni, “Nano-opto-mechanically modulated plasmonic nanoantenna-integrated quantum cascade laser,” SPIE Optics+Photonics (2012).
3) J. Kohoutek, A. Bonakdar, D. Dey, R. Gelfand, I. Hassani, **O. G. Memis**, V. Fathipour, H. Mohseni, “Antenna integrated quantum cascade laser switchable via telecommunications wavelength probe beam” SPIE Optics+Photonics (2012).
4) **O. G. Memis**, H. Mohseni, "New generation of isolated nano-injection detectors and imagers," Information Optics (WIO), 2011 10th Euro-American Workshop on , 1-3, (2011).
5) D. Dey, J. Kohoutek, A. Bonakdar, R. M. Gelfand, **O. G. Memis**, H. Mohseni, "Plasmonic antenna integrated Quantum Cascade Laser for mode confinement used for high sensitivity bio-sensing applications," Photonics Conference (PHO), 2011 IEEE , 77-78, (2011).
6) J. Kohoutek, D. Dey, A. Bonakdar, A. Sklar, **O.G. Memis**, R. Gelfand, H. Mohseni, " Opto-mechanical force measurement of deep sub-wavelength plasmonic modes", Proceeding of SPIE, Paper No. 8097-63 (2011).
7) J. Kohoutek, D. Dey, A. Bonakdar, R. Gelfand, A. Sklar, **O.G. Memis**, H. Mohseni, "Optical Force Mapping of Plasmonic Modes Generated by a Nanoantenna", IEEE Photonics Society, IPC 2011, Paper No. MX 5 (2011).
8) **O.G. Memis,** J. Kohoutek, W. Wu, R.M. Gelfand, and H. Mohseni, “Short-Wave Infrared Nano-Injection Imaging Sensors ”, IEEE Sensors 2010, 1765 (2010).
9) W. Wu, D. Dey**, O. G. Memis**, and H. Mohseni, “Modeling of an Electrically Tunable Quantum Dot Photodetector for Terahertz Detection”, Proc. SPIE, Vol. 7601, 760109, (2010).
10) **O. G. Memis**, J. Kohoutek, D.Dey, W.Wu and H. Mohseni, “Resonant Tunneling Injection Detector and Imagers,” IEEE Photonics Society, 22nd Annual Meeting of the, TuCC2, 47, (2009).
11) Dibyendu Dey, Wei Wu, **Omer G. Memis**, and Hooman Mohseni, “Design and Simulation of an Electrically Tunable Quantum Dot Cascade Laser”, Proc. SPIE, Vol. 7406, 74060Q, (2009).
12) H. Mohseni, J. Kohoutek, and **O. G. Memis**, “A Novel Opto-electro-mechanical Photon Sensor”, Proc. SPIE, Vol. 7222, 72220S, (2009).
13) D. Dey, W. Wu, **O. G. Memis**, H. Mohseni, “Injectorless Quantum Cascade Laser with very Low Voltage-Defect Grown by Metal-Organic Chemical Vapor Deposition,” IEEE Lasers and Electro-Optics Society, 21st Annual Meeting of the, 800, (2008).
14) **O. G. Memis**, W. Wu, D. Dey, A. Katsnelson, H. Mohseni, “A High-Gain Low-Noise Single-Photon Detector for SWIR”, Government Microcircuit Applications and Critical Technology Conference, Nanosensor Tech II 5.1, (2008).
15) W. Wu, D. Dey, **O. G. Memis**, A. Katnelson and H. Mohseni, “Electrically Confined Quantum Dot Intersubband Optoelectronic Devices,” IEEE Lasers and Electro-Optics Society, 21st Annual Meeting of the, 618, (2008).
16) J. Kohoutek, **O. G. Memis** and H. Mohseni, “An Optoelectromechanical Light Sensor at 1.55 µm,” IEEE Lasers and Electro-Optics Society, 21st Annual Meeting of the, 719, (2008).
17) **O. G. Memis**, A. Katsnelson and H. Mohseni, “Low Noise, High Gain Short-Wave Infrared Nano-Injection Photon Detectors with Low Jitter,” IEEE Lasers and Electro-Optics Society, 21st Annual Meeting of the, 159, (2008).
18) W. Wu, D. Dey, **O.G. Memis**, A. Katsnelson and H. Mohseni, “A novel self-assembled and maskless technique for highly uniform arrays of nano-holes and nano-pillars”, NSTI Nanotech 2008, 1, 574-577, (2008).
19) **(Invited) O. G. Memis**, A. Katsnelson, H. Mohseni, M. Yan, S. Zhang, T. Hossain, N. Jin, I. Adesida, “A bio-inspired single photon detector with suppressed noise and low jitter”, Proceeding of SPIE Vol. 7035, 70350V, (2008).
20) W. Wu, D. Dey, **O. G. Memis**, A. Katsnelson, H. Mohseni, “A novel lithography technique for formation of large areas of uniform nanostructures”, Proceeding of SPIE Vol. 7039, 70390P, (2008).

21) W. Wu, D. Dey, **O.G. Memis**, A. Katsnelson and H. Mohseni, “A novel self-aligned and maskless process for formation of highly uniform arrays of nano-holes and nano-pillars”; Joint Conferences on Interaction Among Nanostuctures, IAN005V (2008).

22) H. Mohseni, **O. G. Memis**, S.C. Kong, A. Katsnelson, and W.Wu, “A Novel SWIR Detector with an Ultra-high Internal Gain and Negligible Excess Noise”, Proc. SPIE 6737, 67370W (2007)

23) **O.G. Memis**, W. Wu, D. Dey, A. Katsnelson, H. Mohseni, “A type-II near-infrared detector with very high stable gain and low noise at room temperature”; Semiconductor Device Research Symposium, International, 1-2, (2007).

24) **O.G. Memis**, W. Wu, D. Dey, A. Katsnelson and H. Mohseni, “Detailed Numerical Modeling of a Novel Infrared Single Photon Detector for $\lambda > 1\mu m$”, 7th International Conference on Numerical Simulation of Optoelectronic Devices, 63-64, (2007).

25) **O. G. Memis**, S.C. Kong, A. Katsnelson, M.P. Tomamichel, and H. Mohseni, “A Novel Avalanche-free Single Photon Detector,” Sixth IEEE Conference on IEEE-NANO 2006. Volume 2, pp. 742 - 745, (2006).

26) **O. G. Memis**, S.C. Kong, A. Katsnelson, P.A. Behr and H. Mohseni, “Novel Type-II Infrared Single Photon Detector,” Proceedings of IEEE Laser and Electro-Optics Society Summer Topical Meeting, pp. 29-30, (2006).

27) H. Mohseni, **O.G. Memis,** and S.C. Kong, “A Novel Avalanche-Free Single Photon Detector,” IEEE Proceedings of Indium Phosphide and Related Material, TuA2.1 (2006).

28) H. Mohseni, **O. G. Memis,** S. C. Kong, A. Katsnelson, “A novel nano-injector-based single-photon infrared detector,” Proceedings of SPIE, Vol. 6243 , Enabling Photonics Technologies for Defense, Security, and Aerospace Applications II, pp. 242-247, (2006).

29) **O. G. Memis,** O. Aytur, E. Atalar, “Optical transmission of MRI signals: A safe alternative for internal MRI probes”, Proceedings of ESMRMB 20th Annual Scientific Meeting, (2003).