PETER GILGUNN [redacted] peter.j.gilgunn at gmail.com
Pittsburgh, PA 15217

OBJECTIVE

To apply my research engineering expertise hands-on to create industry-leading technologies

PROFESSIONAL EXPERIENCE

2012 – present
Assistant Research Professor of Electrical and Computer Engineering
Carnegie Mellon University, Pittsburgh, PA
- Driving multidisciplinary research for the biointegration of technology
- Developing implantable neural probes and wearable biosensing devices
- Directing a team of 8 research assistants and managing a microfabrication laboratory
- Teaching electromechanics, semiconductor device physics and circuit analysis

2010 – 2012
Post-Doctoral Research Fellow in Complex Engineered Systems
Carnegie Mellon University, Pittsburgh, PA
- Designed and fabricated ultra-compliant neural prostheses for chronic applications
- Developed and deployed a web-based micro and nano-system design community

2004 – 2010
Research Assistant in Electrical and Computer Engineering
Carnegie Mellon University, Pittsburgh, PA
- Designed and fabricated electrothermally actuated SOI-CMOS-MEMS micromirrors
- Modeled plasma-etch-induced microstructure heating validated by infrared imaging
- Modeled aspect ratio dependent etch and loading variation for DRIE Si etching

2003 – 2004
Principal Process Engineer
Bridge Semiconductor, Pittsburgh, PA
- Developed thin-film co-polymer pyroelectric sensor integration on foundry CMOS
- Developed backend process flow for pyroelectric infrared sensor fabrication
- Produced integrated process flow documentation
- Performed FMEA to identify critical processes and implemented SPC control for them

1999 – 2003
Process Engineering Manager
Infineon Technologies, Richmond, VA
- Led a 24 person process engineering team in a high-volume DRAM process facility
- Created a team that implemented Advanced Process Control (APC) for DRAM

1996 – 1999
Process Engineer
Siemens Microelectronics, Richmond, VA, Newcastle, UK and Dresden, Germany
- Started-up 200 mm DRAM fabrication facilities in US and overseas
- Qualified installed equipment for plasma etch fabrication processes
- Implemented SPC procedures and produced documentation for etch processes

1994 - 1996
Process Engineer
1989 - 1991
GEC-Plessey Semiconductors Ltd., Swindon, England
- Engineered bipolar semiconductor processes for all fabrication operations
- Provided front line first response to fabrication yield and process control excursions

1991 - 1993
Physics Teacher/Lab Manager
Ghana Education Service, Accra, Ghana
- Lectured on theoretical and practical physics to advanced placement level
- Conducted physics labs and managed school physics lab

EDUCATION	
May 2010	PhD in Electrical Engineering, Carnegie Mellon University, Pittsburgh, PA • Dissertation: SOI-CMOS-MEMS Electrothermal Micromirror Arrays
Jun. 2006	MSc in Electrical Engineering, Carnegie Mellon University, Pittsburgh, PA
Jun. 1989	BSc in Physics (1st Class Honours), Paisley College of Technology, Scotland

PROFESSIONAL SKILLS	
Engineering Design and Analysis	COMSOL Multiphysics, Coventor SEMulator, MATLAB-Simulink, Solidworks, JMP/Cornerstone, Cadence, Verilog-AMS Modeling, ImageJ
Scripting	MATLAB, Python, PERL, Mathematica, Verilog
Microfabrication	2 Photon Lithography, 3-D Printing, Ion Milling, Mask Making, Plasma Etching, Acid Processing, Sputtering, Flip-chip Bonding, Dicing, Wirebonding, Spin-casting, Molding, Polishing/Grinding
Analytics and Diagnostics	Scanning Electron Microscopy, White Light Interferometry, Profilometry, Infrared Imaging, Ellipsometry, Probe Station, Focused Ion Beam Imaging, Electrical Impedance Spectroscopy, Cyclic Voltammetry
Advanced Process Control (APC)	Fault Detection and Classification (FDC), Run–to–Run (R2R)
Failure Modes and Effects Analysis	Ford Model
Statistical Process Control	6-sigma, Process Capability (Cp and Cpk), Stability (ISTAB)
Design of Experiments	Full and Fractional Factorial Models, Taguchi

PATENTS	
20140213891	Apparatus and Method for Implantation of Devices into Soft Tissue Assignee: Carnegie Mellon University
20130131482	Fabrication, Methods, Apparatuses, and Systems for Ultra-Compliant Probes for Neural and Other Tissues Assignee: Carnegie Mellon University
6,957,581	Acoustic Detection of Mechanically Induced Circuit Damage Assignee: Infineon Technologies Richmond, LP

PROFESSIONAL ACTIVITIES AND HONORS	
Senior Member	IEEE and Engineering in Medicine and Biology Society
Technical Reviewer	IEEE Journal of Microelectromechanical Systems, Institute of Physics Journal of Micromechanics and Microengineering, American Institute of Physics Journal of Applied Physics
Honor Society	Phi Kappa Phi, Carnegie Mellon University