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**OBJECTIVE** A challenging position developing novel medical products or technologies.

**EXPERIENCE**

**2003-Present** **BOSTON VA MEDICAL CENTER – Retinal Implant Project** **Boston, MA**  
**Analog VLSI Circuit Designer, Project Manager, Visiting Scientist at MIT**  
Developing and testing a prototype retinal prosthesis for the blind. Leading the electrical system design and test group, which includes 3 other engineers and a technician. Completed two generations of the implant design, tested both in chronic wireless *in vivo* implant research trials. Managing several research budgets totaling over \$1.5M per year. Spearheading the design of all electrical systems, including a custom analog and mixed-signal IC for the next generation implant while coordinating manufacturing and assembly of the present implant by outside vendors. Designed and built inductively coupled telemetry circuits, test circuits, and mechanical fixtures, and a test laboratory.

**2006-2007** **RHYTHMIA MEDICAL – Consultant** **Woburn, MA**  
Designed test circuits. Consulted on test setup and product design.

**1999-2003** **MASSACHUSETTS INSTITUTE OF TECHNOLOGY** **Cambridge, MA**  
**Graduate Research Assistant – PhD Project**  
Designed an analog VLSI system to stimulate neural tissue using 53% less power than the most aggressive traditional design, 66% less than commonly-used designs. Designed an inductively coupled RF system with class E amplifier to wirelessly power the implant. Built and tested system; received patent #7,295,872 for novel low-power stimulator.

**1997-1999** **Graduate Research Assistant – MEng Project**  
Designed and built a portable, battery-powered, 100-channel retinal stimulation system. Operated the system in six human surgical trials.

**1996** **Advanced Undergraduate Project**  
Designed a mechanical ink ejection system to mark faulty assembly line parts.

**1992-1995** **Undergraduate Research**  
Determined the mechanical properties of cartilage under static and dynamic compression.

**1996** **M/A-COM, INC. – Test Design Engineer** **Lowell, MA**  
Designed a 50 GHz system to test S parameters for microwave and millimeter wave chips.

**1995** **UNIVERSITY OF PITTSBURGH** **Pittsburgh, PA**  
**Research Assistant – Department of Neurosurgery**  
Developed analog circuits to measure impedance of brain tissue and cerebrospinal fluid. Wrote Matlab models of current density near multiple resistivity boundaries.

**1994** **Research Assistant – Musculoskeletal Research Center**  
Developed experimental hardware and software system for hydrostatic cartilage testing.

**TEACHING EXPERIENCE**

**1996 – 1997** **MASSACHUSETTS INSTITUTE OF TECHNOLOGY** **Cambridge, MA**  
**MESH – Physics Advisor**  
Advised high school student teachers in AP Physics in MIT Educational Studies Program summer course. Taught an elective engineering class.

**1996** **Graduate Teaching Assistant – Digital Electronics Lab**  
Taught recitations, wrote problem sets and exams, helped students in design and debugging.

**EDUCATION**

**2003** **MASSACHUSETTS INSTITUTE OF TECHNOLOGY** **Cambridge, MA**  
**PhD in Electrical Engineering**  
GPA: 4.8 / 5.0  
Thesis: “A System for Efficient Neural Stimulation with Energy Recovery”  
Advisor: Professor John Wyatt

**1998** **MEng in Electrical Engineering**

**1996** **SB in Electrical Engineering**  
Minors in Biology, Biomedical Engineering

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<b>HONORS / AWARDS/ MEMBERSHIPS</b>	VA Career Development Award IEEE Member Sigma Xi Scientific Research Society ARVO Member Catalyst Foundation Fellowship Richard P. Simmons '53 Scholarship Bell of Pennsylvania Scholarship United States Presidential Scholar	2008-present 2003-present 2002-present 2001-present 1998-2003 1992-1996 1992-1996 1992
<b>SELECTED PATENTS / PUBLICATIONS</b>	<p>“System for and Method of Power Efficient Electrical Tissue Stimulation” S.K. Kelly, J.L. Wyatt, J.F. Rizzo. United States Patent # 7,295,872, Issued 2007.</p> <p>“Realization of a 15-Channel Hermetically-Encased Wireless Subretinal Prosthesis for the Blind.” S.K. Kelly, et.al, Proc. IEEE Eng. In Med. Bio. Conf., pp. 200-203, 2009.</p> <p>“Development and Implantation of a Minimally-Invasive, Wireless Subretinal Neurostimulator.” D.B. Shire, S.K. Kelly, J. Chen, P. Doyle, M.D. Gingerich, S.F. Cogan, W. Drohan, O. Mendoza, L. Theogarajan, J.L. Wyatt, J.F. Rizzo. IEEE Trans. Biomed. Eng., Vol. 56, No. 10, Oct. 2009, pp. 2502-2511.</p> <p>“Minimally Invasive Retinal Prosthesis.” L. Theogarajan, J. Wyatt, J. Rizzo, B. Drohan, M. Markova, S. Kelly, G. Swider, M. Raj, D. Shire, M. Gingerich, J. Loewenstein, B. Yomtov. IEEE Int'l Solid-State Circuits Conf., 2006.</p> <p>“A Power-Efficient, Voltage-Based Neural Tissue Stimulator with Energy Recovery.” S.K. Kelly, J.L. Wyatt, IEEE Int'l Solid-State Circuits Conf., 2004.</p> <p>“Improved Class A Based Transmitter System for Wireless Retinal Implant Data Telemetry.” S.K. Kelly, et.al. Abstract 4578, ARVO, 2009.</p> <p>“Exploration of Optimal Coil Designs for Retinal Implant Power and Data Telemetry.” S.K. Kelly et. al. Abstract 647, ARVO, 2007.</p> <p>“Low-Power Neural Stimulator for a Retinal Prosthesis.” S.K. Kelly, J.L. Wyatt. Abstract 4174, ARVO, 2004.</p> <p>“Methods for Acute Electrical Stimulation of Retina with Microelectrode Arrays and Measurement of Perceptual Thresholds in Humans.” J.F. Rizzo, J.L. Wyatt, J. Loewenstein, S.K. Kelly, D.B. Shire. Invest. Ophth. and Vis. Sci., 2003, 44: 5555-5361.</p> <p>“Perceptual Efficacy of Electrical Stimulation of Human Retina with a Microelectrode Array During Acute Surgical Trials.” J.F. Rizzo, J.L. Wyatt, J. Loewenstein, S.K. Kelly, D.B. Shire. Invest. Ophth, and Vis. Sci., 2003, 44: 5361-5369.</p> <p>“The Electrical Conductivity of Human Cerebrospinal Fluid at Body Temperature.” Baumann, S.B.; Wozny, D.R.; Kelly, S.K.; Meno, F.M.; IEEE Trans. on Biomedical Engineering, Vol. 44, Issue 3, March, 1997, pp. 220-223.</p>	
<b>TECHNICAL SKILLS</b>	Analog and digital circuit design and debugging equipment; Tanner Tools, Cadence layout and simulation software; PC board layout; test and measurement equipment; spice; Matlab; machine shop equipment. Experience with Windows, Unix, and Mac platforms, LATEX, Postscript, Matlab, Perl.	
<b>LEADERSHIP / ACTIVITIES</b>	Alumni Advisory Board, MIT Tech Catholic Community (Co-chair) Strategic Advisory Committee to the Chancellor Dormitory President, member of MIT Dormitory Council PhD Thesis Reading Committee, University of New South Wales PhD Thesis Design Review Committee, Tufts University ECE Dept. Science Advisor to Sloan students writing retinal implant business plan Science Advisor to Boston College students writing implant business plan Industry Advisor to RISD student designing retinal implant mockup Volunteer math and science tutor for ESL adult education program Varsity Cross-country, Indoor and Outdoor Track	2005-present 1999-2000 1995-1996 2008 2006 2004, 2007 2005, 2006 2005 2003-2006 1992-1996