

**Shelley Fried, PhD
Curriculum Vitae**

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Year	Degree	Field of Study (Thesis advisor for doctoral degrees)	Institution
1982	BE	Mechanical Engineering	The Cooper Union
1986	MS	Biomedical Engineering	Penn State University
2004	PhD	Vision Science (Frank Werblin)	UC Berkeley

Postdoctoral Training

Year(s)	Title	Specialty/Discipline (Lab PI for postdoc res.)	Institution
2004-5	Fellow	Neural Prosthetics (Frank Werblin)	UC Berkeley
2006-7	Fellow	Neural Prosthetics (Masland, Eddington, Rizzo)	MGH

Faculty Academic Appointments

Year(s)	Academic Title	Department	Academic Institution
2007	Research Scientist	Ctr. for Innovative Visual Rehab.	Boston VA Healthcare System
2007	Instructor	Neuroscience	Harvard Medical School
2011	Assistant Professor	Neuroscience (in progress)	Harvard Medical School

Appointments at Hospitals/Affiliated Institutions

2007	Asst in Neuroscience	Neurosurgery	MGH
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Professional Societies

Year(s)	Society Name	Role
2005 – Pres	IEEE – Engineering in Medicine and Biology Society	Member
2006 – Pres	BioMedical Engineering Society	Member
2007 – Pres	Society for Neuroscience	Member
2008 – Pres	American Physiological Society	Member

Report of Regional, National and International Invited Teaching and Presentations

Year	Location	Title of presentation or name of course	Type of presentation/role(s) (note if abstract)	Sponsor/Source of compensation
National				
2008	Los Angeles, CA	Electric stimulation activates two segments of the axon in retinal ganglion cells	Speaker (abstract)	BMES / Grant funds
2008	Detroit, MI	Different portions of the ganglion cell axon are activated by epiretinal stimulation of the rabbit retina	Speaker (abstract)	Eye and the Chip
2009	Ft. Lauderdale, FL	Differences in Sodium Channel Bands Underlie Different Responses to Electrical Stimulation in Retinal Ganglion Cells.	Author (abstract)	VA Healthcare System / Grant funds
2009	Kansas City, MO	Creating physiological patterns of activity with prosthetic stimulation	Speaker (abstract)	Dept. of Defense
2010	Ft. Lauderdale, FL	Low Frequency Sinusoids Avoid Axonal Stimulation With Retinal Prosthetics	Speaker (abstract)	VA Healthcare System / Grant funds
2010	Ft. Lauderdale, FL	Individual Classes of Retinal Neurons Can Be Selectively Activated by Modulating the Frequency of Electric Stimulation	Author (abstract)	VA Healthcare System / Grant funds
2010	Long Beach, CA	Towards improved stimulation methods with retinal prosthetics	Speaker (abstract)	Neural Interfaces Conference
2010	Detroit, MI	Targeting specific neural types with electric stimulation	Speaker (abstract)	The Eye and the Chip
International				
2007	Bonn, Germany		Speaker (abstract)	German Fed for Blind
2009	Bonn, Germany	The distribution of voltage across the proximal axon underlies spike initiation in response to electric stimulation of retinal ganglion cells.	Speaker (abstract)	German Fed for Blind
2010	Beijing, China	Low frequency sinusoidal stimulation avoids the activation of axons	Speaker (abstract)	Conference

Report of Scholarship

Publications

- **Peer Reviewed Publications in print or other media**

Gaumont RP & **Fried SI** (1986). Analysis of cat multi-channel acoustic brain-stem response data using dipole localization methods. *ECN*. Apr; 63(4):376-83.

Fried SI, Münch TA & Werblin FS (2002). Mechanisms and circuitry underlying directional selectivity in the retina. *Nature*. Nov 28;420(6914):411-4. Featured in: News and Views.

Fried SI, Münch TA & Werblin FS (2005). Directional selectivity is formed at multiple levels by laterally offset inhibition in the rabbit retina. *Neuron*. 2005 Apr 7;46(1):117-27.

Fried SI, Hsueh HA & Werblin FS (2006). A method for generating precise temporal patterns of retinal spiking using prosthetic devices. *J. Neurophys.* Feb (95):970-8.

Fried SI, & Masland, RH (2007). Image processing: How the retina detects the direction of image motion. *Curr. Biol.* 2007 Jan 23;17(2):R63-6

Fried SI, Lasker AC, Desai NJ, Eddington DK & Rizzo JF (2009). Axonal sodium channel bands shape the response to electric stimulation in retinal ganglion cells. *J. Neurophys.* Apr;101(4):1972-87.

Freeman, DK, Rizzo, JF & **Fried, SI** (2010). Electric stimulation with sinusoids and white noise for neural prostheses. *Front. Neuropro.* doi:10.3389/neuro.20.001-4. PMID: 20582268

Freeman, DK, Eddington, DK, Rizzo, JF & **Fried, SI** (2010). Selective Activation of Neuronal Targets with Sinusoidal Electric Stimulation. *J Neurophysiol.* 2010 Nov;104(5):2778-91. PMID: 20810683

Freeman, DK & **Fried, SI** (2011). Multiple Components of Ganglion Cell Desensitization in Response to Prosthetic Stimulation. *J Neural Eng.* 2011; Jan 19;8(1) 016008. PMID 21248379

Jeng, J, Tang, S, Molnar, A, Desai, NJ & **Fried, SI** (2011). The sodium channel band shapes the response to electric stimulation in retinal ganglion cells. *J. Neural Eng.* 8 (2011) 036022. PMID 21558602.

Freeman, DK, Rizzo III, JF, **Fried, SI**. (2011) Encoding Visual Information in Retinal Ganglion Cells with Prosthetic Stimulation. *J. Neural Eng.* 2011 May 18;8(3):035005. PMID 21593546

Cai, C, Ren, Q, Desai, NJ, Rizzo III, JF, **Fried, SI**. (2011) Response variability to high rates of electric stimulation in retinal ganglion cells. *J. Neurophysiology*. Accepted.

Freeman, DK, Jeng, JS, Kelly, SK, Hartveit, E, **Fried, SI**. (2011). Calcium channel dynamics limit synaptic release in response to prosthetic stimulation with sinusoidal waveforms – a computational study. *J. Neural Eng.* Accepted.

- **Non-peer reviewed scientific or medical publications/materials in print or other media**

Fried SI, Hsueh HA & Werblin FS (2007). Generating precise patterns of retinal spiking. Proceedings of the 2nd Annual Dept. of Energy (DOE) Conference on Retinal Prosthetics, Ft. Lauderdale, Florida (USA).

Fried SI and Jensen, RJ, (2011). Electric stimulation of the retina: the contribution of animal studies
Retinal Prosthetics, G.Dagnelie, Ed., Springer.

Abstracts, Poster Presentations and Exhibits Presented at Professional Meetings:

Fried SI & Werblin FS (2004). Electrical stimulation elicits complex response patterns in the retina.
Proceedings of the International Joint Conference on Retinal Prosthetics, Budapest. (Hungary).

Fried SI & Werblin FS (2006). Targeting specific ganglion cell types with prosthetic stimulation.
Association for Vision in Research and Ophthalmology Annual Meeting, Ft. Lauderdale, FL.

Wyatt, JL., Eisenman,A, Valavanis,S, Fried,S, Stasheff,S & Rizzo, JF. (2007). A Likelihood Method for
Estimating Visual Motion Parameters From Retinal Ganglion Cell Responses. Association for Vision
in Research and Ophthalmology Annual Meeting, Ft. Lauderdale, FL.

Wyatt,JL, Valavanis,S, Wu,YC, Nemati,S, Eisenman,A, Fried,S, Stasheff,S & Rizzo, JF (2008). A
Likelihood Method for Estimating Visual Motion Parameters From Retinal Ganglion Cell Responses.
Association for Vision in Research and Ophthalmology Annual Meeting, Ft. Lauderdale, FL.

Drohan W, Wyatt, JL, Kelly, SK, Fried, SI & Rizzo, JF (2008). External Field Firing Thresholds for
Neurons Association for Vision in Research and Ophthalmology Annual Meeting, Ft. Lauderdale, FL.

Jeng J, Desai, NJ, Rizzo, JF & Fried SI (2009). Effects of Variations in the Dense Sodium Channel Band
in Retinal Ganglion Cells. Association for Vision in Research and Ophthalmology Annual Meeting,
Ft. Lauderdale, FL.

Fried SI, Desai, NJ, Eddington, DK & Rizzo, JF (2009). The Distribution of Voltage Across the Proximal
Axon Underlies Spike Initiation in Response to Electric Stimulation of Retinal Ganglion Cells.
Association for Vision in Research and Ophthalmology Annual Meeting, Ft. Lauderdale, FL.

N.J. Desai, J.F. Rizzo, S.I. Fried, C. Cai (2010). Sodium Channel Band Properties Contribute to
Activation Threshold Variability. Association for Vision in Research and Ophthalmology Annual
Meeting, Ft. Lauderdale, FL.

J.S. Jeng, J.F. Rizzo, S.I. Fried (2010). Sodium Channel Band Properties Contribute to Activation
Threshold Variability. Association for Vision in Research and Ophthalmology Annual Meeting, Ft.
Lauderdale, FL.