

CURRICULUM VITAE FOR PROMOTION AND TENURE**Suhasa B Kodandaramaiah****Benjamin Mayhugh Assistant Professor
Department of Mechanical Engineering****Graduate Faculty
Department of Biomedical Engineering****University of Minnesota, Twin Cities****Education**

Degree	Institution	Date Degree Granted
B.E. Mechanical Engineering	Visveshwaraya Technological University	2006
M.S. Mechanical Engineering	University of Michigan, Ann Arbor	2008
Ph.D. Mechanical Engineering Advisor: Prof. Craig. R. Forest	Georgia Institute of Technology, Atlanta	2013

Positions/Employment

University of Minnesota, Twin Cities campus Benjamin Mayhugh Assistant Professor	Dec 2015 - current
University of Minnesota, Twin Cities campus Graduate Faculty, Biomedical Engineering	Jan 2017 - current
Massachusetts Institute of Technology, Cambridge, MA Post-Doctoral Associate	Jan 2013 - Dec 2015
Neuromatic Devices Inc Scientific Consultant	Apr 2013 - Sep 2013
Intan Technologies Inc Technical Consultant	Feb 2014 - Sep 2014
Georgia Institute of Technology Graduate Research Assistant	Sep 2009 – Dec 2012
MKP Structural Design Associates Research Engineer	Jan 2009 – Aug 2009
University Of Michigan, Ann Arbor	Jan 2007 – Dec 2008

Graduate Research Assistant

Current Membership in Professional Organizations

Institute for Engineering in Medicine
University of Minnesota, Twin Cities, MN

Jan 2016 - current

HONORS AND AWARDS FOR RESEARCH/CREATIVE WORK, TEACHING, PUBLIC ENGAGEMENT, AND SERVICE

- 1) Included in Forbes Magazine's 2012 list of "30 under 30 rising stars in science and medicine"
- 2) Outstanding Poster Presentation Award at the Georgia Tech Research and Innovation Conference (GTRIC) (2012)
- 3) Outstanding Poster Presentation Award at the Georgia Tech Research and Innovation Conference (GTRIC) (2011)
- 4) R.V. Jones Memorial Scholarship by the American Society of Precision Engineering (ASPE), awarded for the best student paper at the ASPE conference in Atlanta (2010)
- 5) ME Department International Student Fellowship: Awarded for research and academic achievements by the Department of Mechanical Engineering, University of Michigan (2008)
- 6) Rackham Travel Grant, for attending the 7th International IEEE conference on Sensors (2007)
- 7) 7th Rank (97% percentile) in Common Entrance Exam for Design (CEED), A National level Design Aptitude Test in India (2006)
- 8) Distinction Award: Awarded by the PES Institute of Technology for securing First Class Distinction through all semesters of study: BE, Mechanical Engineering (2006-2002)
- 9) Best Paper Presentation Award (MEMS based variable capacitances) Cognizance-2003
- 10) National Scholarship Scheme Award, Govt. of India, for securing 99.9 percentile (out of >200,000 examinees) in the national level board examinations in Social Studies (2000)

RESEARCH

Publications

Refereed Journal Articles

- 1) **S. B. Kodandaramaiah***, F. J. Flores*, G. L. Holst, A. C. Singer, X. Han , E. N. Brown, Edward S. Boyden[^], C. R. Forest[^] Multi-neuron intracellular recording in vivo via interacting autpatching robots, Elife, DOI: [10.7554/eLife.24656](https://doi.org/10.7554/eLife.24656)
* Equal Contribution, [^] Co-corresponding authors
- 2) I. Kolb, G. Talei Franzesi, M. Wang, **S. B. Kodandaramaiah**, C. R. Forest, E. S. Boyden, and A. C. Singer, Evidence for long-timescale patterns of synaptic inputs in CA1 of awake behaving

mice, Journal of Neuroscience, 26 December 2017, 1519-17; DOI: <https://doi.org/10.1523/JNEUROSCI.1519-17.2017>

3) K. D. Piatkevich, H. J. Suk, **S. B. Kodandaramaiah**, F. Yoshida, E. M. DeGennaro, M. Drobizhev, T. E. Hughes, R. Desimone, E. S. Boyden, V. V. Verkhusha, Near-Infrared Fluorescent Proteins Engineered from Bacterial Phytochromes in Neuroimaging, Biophysics Journal, Volume 113, Issue 10, 21 November 2017, 2299-2309, DOI: <https://doi.org/10.1016/j.bpj.2017.09.007>

4) H. Jun-Suk, I. Van Welie, **S. B. Kodandaramaiah**, B. D. Allen, C. R. Forest, E.S. Boyden, Closed-Loop Real-Time Imaging Enables Fully Automated Cell-Targeted Patch-Clamp Neural Recording *In Vivo*, Neuron, 2017, DOI: <https://doi.org/10.1016/j.neuron.2017.08.011>

5) N. Grossman, D. Bono, N. Dedic*, **S. B. Kodandaramaiah***, A. Rudenko, H. Suk, A. M. Cassara, E. Neufeld, N. Kuster, L. Tsai, A. Pascual-Leone, E. S. Boyden, Noninvasive Deep Brain Stimulation via Temporally Interfering Electric Fields, Cell, 2017, DOI: <http://dx.doi.org/10.1016/j.cell.2017.05.024>

* Equal contribution

6) A. C. Singer, G. Talei Franzesi, S. B. Kodandaramaiah, F. J. Flores, J. D. Cohen, A. K. Lee, C. Börgers, C. R. Forest, N.J. Kopell, E. S. Boyden, Mesoscale-duration activated states gate spiking in response to fast rises in membrane voltage in the awake brain, J Neurophysiology, 2017, DOI: 10.1152/jn.00116.2017

7) Q. Wu, I. Kolb, B. Callahan, Z. Su, W. Stoy, **S. B. Kodandaramaiah**, R. Neve, H. Zeng, E.S. Boyden, C. R. Forest, and Alexander Chubykin, Integration of autpatching with automated pipette and cell detection in vitro, Journal of Neurophysiology, 2016, DOI:10.1152/jn.00386.2016

8) **S. B. Kodandaramaiah**, I. R. Wickersham, G. B. Holst, A. C. Singer, G. Talei-Franzesi, C. R. Forest, E. S. Boyden, Assembly and operation of the autpatcher for automated intracellular neural recording in vivo, Nature Protocols, 2016

9) M.V. Baratta, **S.B. Kodandaramaiah**, P.E. Monahan, P.-A. Lin, K. Kim, A. Yang C.R. Forest, E.S. Boyden, K.A. Goosens, Stress enables reinforcement-elicited serotonergic consolidation of fear memory. Biological Psychiatry, 2015

10) R. R. Harrison, I. Kolb, **S. B. Kodandaramaiah**, A. A. Chubykin, A. Yang, M. F. Bear, E. S. Boyden, C. R. Forest, Microchip amplifier for in vitro, in vivo, and automated whole-cell patch-clamp recording, J Neurophysiology, 2014

11) A. S. Chuong, M. L. Miri* , V. Busskamp*, G.A.C. Matthews*, L.C.Acker*, A.T. Soresnsen, A. Young, N. C. Klapoetke, M.A. Henninger, **S.B. Kodandaramaiah**, M. Ogawa, S. B. Ramanlal, R. C. Bandler, B. D. Allen, C.R. Forest, B.Y.Chow, X. Han, Y. Lin, K.M. Tye, R. Roska , J.A. Cardin, E. S. Boyden, Noninvasive optical inhibition with a red-shifted microbial rhodopsin, Nature Neuroscience, 2014 (*, equal contribution)

12) **S. B. Kodandaramaiah**, E.S. Boyden and C. R. Forest, E. S. Boyden, *In Vivo* Robotics: Towards the Automation of Neuroscience and Other Intact-System Biological Fields, Annals of New York Academy of Sciences, 2013

13) **S.B. Kodandaramaiah**, G. Talei Franzesi, B.Y. Chow, E.S. Boyden, C.R. Forest, Automated whole-cell patch clamp electrophysiology of neurons *in vivo*. Nature Methods, 2012

Refereed Conference Proceedings

1) L. Ghanbari, R. Carter, M. Rynes, J. Dominguez, J. Hu, N. Mossazghi, M. Laroque, T. Ebner, **S. B. Kodandaramaiah**, Brain Windows: Digitally Generated 3D Cranial Windows for Pan Cortical Neural Interfacing, Proceedings of the 2017 Design of Medical Devices Conference, Minneapolis, MN, April 10th-12th, 2018 (Accepted)

2) G.Shull, C. Haffner, W. Huttner, **S. B. Kodandaramaiah**, E. Taverna, A robot for high throughput analysis of neural stem cells in intact tissue, Proceedings of the 2017 Design of Medical Devices Conference, Minneapolis, MN, April 10th-12th, 2018 (Accepted)

3) M. Rynes, L. Ghanbari, J. Hu, D. S. Schulman, G. Johnson, M. Laroque, **S. B. Kodandaramaiah**, Principles of Computer Numerical Control Applied to Small Animal Microsurgical Procedures, Proceedings of the 2017 Design of Medical Devices Conference, Minneapolis, MN, April 10th-12th, 2018 (Accepted)

4) G. Johnson, L. Lehto, S. Mangia, O. Gröhn, S. Michaeli, **S. B. Kodandaramaiah**, Conceptual Design of Flex-DBS, a Mechanically Reconfigurable Deep Brain Stimulation Probe, Proceedings of the 2017 Design of Medical Devices Conference, Minneapolis, MN, April 11th-13th, 2017

5) B. D. Allen, C. Moore-Kochlacs, J. Scholvin, J. B. Kinney, J. Bernstein, **S. B. Kodandaramaiah**, N. Kopell, E. S. Boyden, Towards ground truth in ultra-dense neural recording, Proceedings of the Computational and Systems Neuroscience (Cosyne) Meeting 2016, Salt Lake City, UT, February 25 - 28, 2016.

6) A. Singer, G.T. Franzesi, **S. B. Kodandaramaiah**, F. Flores, C. Forest, N. Kopell, E. Boyden, Interaction of Slow Network Integration and Fast Neural Integration Towards Spike Generation, Proceedings of the Computational and Systems Neuroscience (Cosyne) Meeting 2015, Salt Lake City, UT, Mar 5-8, 2015.

7) **S.B. Kodandaramaiah**, F. Flores, G. Holst, I. Wickersham, E. Brown, C.R. Forest, E.B. Boyden, The Multipatcher: A Robot for High Density Measurement of Intracellular Recordings In Vivo, Proceedings of the Biomedical Engineering Society (BMES) 2014, San Antonio, TX, Oct 22-25, 2014.

8) I. Kolb*, G. Holst*, **S.B. Kodandaramaiah**, W. Stoy, E.S. Boyden, C.R. Forest. Linear Micro-Actuation System for Patch-Clamp Recording. Proceedings of the 29th Annual Meeting of the American Society for Precision Engineering. Boston, MA.

9) J. Go, A. Fan, C. Lu, **S. B. Kodandaramaiah**, G. L. Holst, W. Stoy, I. Kolb, E. S. Boyden, C. R. Forest, Fully-automated in vivo single cell electrophysiology, *Proceedings of the 28th Annual Meeting of the American Society for Precision Engineering 2013*, St. Paul, MN, October 20-October 25, 2013

10) I. Kolb, G. B. Holst, B. Goldstein, **S.B. Kodandaramaiah**, E.S. Boyden, E. Culurciello, C.R. Forest, Automated, in-vivo, whole-cell electrophysiology using an integrated patch-clamp amplifier, Proceedings of the 22nd Annual Computational Neuroscience Meeting (CNS 2013), Paris, France, July 13-18, 2013.

- 11) **S. B. Kodandaramaiah**, A. S. Chuong, M. Ogawa, N. Klapoetke, M. Baratta, L. C. Acker, P. E. Monahan, F. Yoshida, E. S. Boyden, and C. R. Forest, Integration of automated patch clamp electrophysiology system with optogenetics for cell type identification in vivo, *Proceedings of the Annual Meeting of the Biomedical Engineering Society (BMES) 2012*, Atlanta, GA, October 24-27, 2012
- 12) D. Chiyo, **S. B. Kodandaramaiah**, K. Grosh, Z. D. Ma, B. Raju, F. R. Abadi, Reactive Structure and Smart Armor for Army's Future Ground Vehicles, *Proceedings of 25th Annual Army Sciences Conference (ASC 2010)*, Orlando, Florida, November 29 - December 2, 2010.
- 13) **S. B. Kodandaramaiah**, S. Malik, C. R. Forest, Design and performance of telescoping micropipette arrays for high-throughput in vivo patch clamping, *Proceedings of the 25th Annual Meeting of the American Society for Precision Engineering*, Atlanta, GA, October 31-November 5, 2010, **Awarded R.V. Jones Memorial Award for Best Student Paper.**
- 14) N. Pak, C.R. Phaneuf, **S. B. Kodandaramaiah**, and C.R. Forest, Modulation of electromagnetic radiation using a dot matrix printer, *Proceedings of the 25th Annual Meeting of the American Society for Precision Engineering 2010*, Atlanta, GA, October 31-November 5, 2010
- 15) **S. B. Kodandaramaiah**, N. Chronis, An Opto-fluidic sensor for monitoring Intra-cranial pressure (ICP), *Proceedings of the 12th International Conference on micro-Total Analysis Systems*, San Diego, CA, October 2008.
- 16) J. Gregory, Y.S. Ng, E.M. Jung, **S. B. Kodandaramaiah**, Dielectrophoretic whole blood separation device integrating a spiral pump and cytometry, *Proceedings of the 6th IEEE Sensors Conference*, Atlanta, GA, October 2007.

Presentations

Invited Talks and Presentations

- 1) Technologies for Neural Interfacing at Scale: from Single Cells to the Whole Cortex, Department of Biomedical Engineering Seminar, University of Wisconsin, Madison, WI (November 2017)
- 2) Technologies for neuronal interfacing at multiple scales – from single cells to whole cortex, Center for Magnetic Resonance Research, University of Minnesota, Twin Citites (September 2017)
- 3) “Technologies for fully autonomous neuroscience labs”, Transylvania Experimental Neuroscience Summer School, Cluj Napoca, Romania (June 2017)
- 4) “Robotics for investigating neuronal dynamics in intact brains”, Max Planck Institute of Evolutionary biology, Leipzig, Germany (August 2016)
- 5) “Robotic Platforms for High throughput neuroscience”, Department Seminar, School of Dentistry, University of Minnesota, Minneapolis, MN (August 2016)

- 6) “Robotic tools for observing neuronal computations in intact brains.”, Institute for Engineering in Medicine, University of Minnesota, Minneapolis, MN (February 2016)
- 7) “Robotic technologies for high-throughput in vivo drug discovery”, Novartis Institutes for Biomedical Research, Cambridge, MA (June 2015)
- 8) “Robotic technologies for high-throughput in vivo neuroscience”, Max Planck Institute for Cellular and Molecular Biology, Dresden, Germany (August 2014)
- 9) “Robotic technologies for in vivo electrophysiology in awake behaving rodents”, Meeting at the Bio-Computational neuroscience group, Emory University, Atlanta, GA (December 2013)
- 10) “Robotics for *in vivo* electrophysiology: current progress and future directions”, Seminar, Cold Spring Harbor Laboratories, Cold Spring Harbor, NY (July 2012)
- 11) “Automated whole-cell patch clamp electrophysiology of neurons *in vivo*”, McGovern Institute Special Neurotechnology Seminar, McGovern Institute for Brain Research, Massachusetts Institute of Technology, Cambridge MA (September 2011)

Conference Presentations

- 1) L. Ghanbari, R. Carter, M. Rynes, J. Dominguez, J. Hu, N. Mossazghi, M. Laroque, T. Ebner, **S. B. Kodandaramaiah**, Brain Windows: Digitally Generated 3D Cranial Windows for Pan Cortical Neural Interfacing, Neuroscience 2017, Washington D.C, November 11-15, 2017
- 2) G.Shull, C. Haffner, W. Huttner, **S. B. Kodandaramaiah**, E. Taverna, A robot for high throughput analysis of neural stem cells in intact tissue, EMBO Conference: Gene regulatory mechanisms in neural fate decisions, Alicante, Spain, Sep. 7-10, 2017
- 3) M. Rynes, L. Ghanbari, J. Hu, D. S. Schulman, G. Johnson, M. Laroque, **S. B. Kodandaramaiah**, Principles of Computer Numerical Control Applied to Small Animal Microsurgical Procedures, Society for Neuroscience, Washington, DC, November 11-15, 2017
- 4) G.Shull, C. Haffner, W. Huttner, E. Taverna, , **S. B. Kodandaramaiah**, Image Guided Robot for Microinjection into Single Cells in Organotypic Slices of Mouse Telencephalon, Institute for Engineering in Medicine Annual Conference and Retreat, Minneapolis, MN, USA, Nov. 6 2017
- 5) L. Ghanbari, R. Carter, M. Rynes, J. Dominguez, N. Mossazghi, J. Hu, G. Shull, M. Laroque, T. Ebner, **S. B. Kodandaramaiah**, Brain Windows: Digitally Generated 3D Cranial Windows for Pan Cortical Neural Interfacing, Institute for Engineering in Medicine Annual Conference and Retreat, Minneapolis, MN, November 6, 2017
- 6) N. Mossazghi, L. Ghanbari, M. Ryans, J. Dominguez1, J. Jia Hu, R. Carter, T.J. Ebner, **S. B. Kodandaramaiah**, Cranial Prostheses for Chronic, Pan-Cortical Two-Photon Imaging in Behaving Mice, McNair Scholars 27th Annual Summer Poster Symposium, Minneapolis, MN, August 3, 2017.
- 7) N. Mossazghi, L. Ghanbari, M. Ryans, J. Dominguez1, J. Jia Hu, R. Carter, T.J. Ebner, **S. B. Kodandaramaiah**, Cranial Prostheses for Chronic, Pan-Cortical Two-Photon Imaging in Behaving Mice, 2017 North Star STEM Alliance 10th Annual Kick Off, Minneapolis, MN, September 28, 2017.

- 8) N. Mossazghi, L. Ghanbari, M. Ryans, J. Dominguez¹, J. Jia Hu, R. Carter, T.J. Ebner, **S. B. Kodandaramaiah**, Cranial prosthesis for chronic awake imaging in mouse model for episodic ataxia type 2, 2017 Annual Biomedical Research Conference for Minority Students, Phoenix, AZ, November 2017.
- 9) G. Johnson, L. Lehto, S. Mangia, O. Gröhn, S. Michaeli, **S. B. Kodandaramaiah**, Conceptual Design of Flex-DBS, a Mechanically Reconfigurable Deep Brain Stimulation Probe, Design of Medical Devices (DMD) conference, Minneapolis, MN, April 9-12, 2017.
- 10) A.C. Singer, G. Talei Franzesi, **S.B. Kodandaramaiah**, M. Tsitsiklis, S. Sharma, D. Bozic, S. Batir, I.R. Wickersham, G.B. Holst, C.R. Forest, C. Borgers, N.J. Kopell, E.S. Boyden, Time course of subthreshold activity preceding spike generation in awake behaving mouse hippocampus, Proceedings of the Annual Meeting of the Society for Neuroscience (Neuroscience 2014), Washington DC, Nov 15-19, 2014.
- 11) **S.B. Kodandaramaiah**, F.J. Flores, G. Talei Franzesi, A.C. Singer, G. Holst, I.R. Wickersham, C. Borgers, N.J. Kopell, C.R. Forest, E.N. Brown, E.S. Boyden, Automated multiple-cell patch clamp assessment of multineuron subthreshold dynamics in waking and anesthetized states, Proceedings of the Annual Meeting of the Society for Neuroscience (Neuroscience 2014), Washington DC, Nov 15-19, 2014.
- 12) G. Holst, **S.B. Kodandaramaiah**, I. Kolb, W. Stoy, I. Wickersham, A. Singer, L. Li, E.S. Boyden, H. Zeng, C.R. Forest, Highthroughput fully automated patch clamp robot for in-vivo electrophysiology and morphology, Proceedings of the Annual Meeting of the Society for Neuroscience (Neuroscience 2014), Washington DC, Nov 15-19, 2014.
- 13) G.T. Franzesi, A. Singer, I. Kolb, S. Sharma, **S. B. Kodandaramaiah**, M. Tsitsiklis, I. Wickersham, G. Holst, D. Bozic, S. Batir, C. Forest, C. Borgers, N. Kopell, E.S. Boyden, Automated exploration of intracellular mechanisms of in vivo neural computation, Proceedings of the Annual Meeting of the Society for Neuroscience (Neuroscience 2014), Washington DC, Nov 15-19, 2014.
- 14) **S. B. Kodandaramaiah**, F. J. Flores, I. R. Wickersham, G. L. Holst, E. N. Brown, C. R. Forest, E. S. Boyden, The Multipatcher: a robot for high density intracellular recordings *in vivo*. *Proceedings of the 27th Annual Meeting of the Society for Neuroscience*, San Diego, CA, November 9-13, 2013
- 15) A. C. Singer, G. Talei Franzesi, **S. B. Kodandaramaiah**, I. R. Wickersham, S. Sharma, S. Batir, N. Pak, G. Holst, C. R. Forest, N. J. Kopell, E. S. Boyden, Awake Autopatching: Automatic whole cell patch clamp of hippocampal neurons in awake behaving animals, *Proceedings of the 27th Annual Meeting of the Society for Neuroscience*, San Diego, CA, November 9-13, 2013
- 16) G. L. Holst, **S. B. Kodandaramaiah**, C. R. Phaneuf, W. Stoy, I. Kolb, I. R. Wickersham, N. Killian, B. Buffalo, E. S. Boyden, C. R. Forest, Miniaturized actuation system for automated, in-vivo, patch clamp recording, *Proceedings of the 27th Annual Meeting of the Society for Neuroscience*, San Diego, CA, November 9-13, 2013
- 17) J. Go, G. L. Holst, C. Lu, A. Fan, **S. B. Kodandaramaiah**, C. R. Phaneuf, W. Stoy, I. Kolb, I. R. Wickersham, E. S. Boyden, C. R. Forest, Pipette replacement robot to fully automate

sequential patch clamp recordings in-vivo, *Proceedings of the 27th Annual Meeting of the Society for Neuroscience*, San Diego, CA, November 9-13, 2013

18) W. Stoy, C. Shepard, G. L. Holst, I. Kolb, **S. B. Kodandaramaiah**, D. Ollerenshaw, D. Millard, E. S. Boyden, G. B. Stanley, C. R. Forest, Multiple, *In vivo* patch clamp recordings along the mouse vibrissae pathway. *Proceedings of the 27th Annual Meeting of the Society for Neuroscience*, San Diego, CA, November 9-13, 2013

19) F. J. Flores, **S. B. Kodandaramaiah**, I. R. Wickersham, C. R. Forest, E. N. Brown, E. S. Boyden. Multiple whole-cell patch clamp to study state transitions in the awake mouse. *IX Annual meeting of the Chilean Society of Neuroscience & VIII IberoAmerican Congress of Biophysics*, Valparaiso, Chile, Oct 1-4th, 2013. **Voted 'Best Poster Presentation'**

20) **S. B. Kodandaramaiah**, I. Wickersham, S. R. Bates, A. S. Chuong, M. Ogawa, M. V. Baratta, N. Klapoetke, G. Holst, L. C. Acker, F. Yoshida, P. E. Monahan, B. Tasic, H. Zeng, C. R. Forest, E. S. Boyden, Autopatcher application to single cell RNA analysis and optogenetic cell type identification, *Proceedings of the 26th Annual Meeting of the Society for Neuroscience*, New Orleans, LA, October 13-17, 2012

21) **S. B. Kodandaramaiah**, G. Holst, G. Talei Franzesi, A. Singer, I. Wickersham, X. Han, E. S. Boyden, C. R. Forest, The Multipatcher: a robot for automated, simultaneous whole-cell patch clamping of multiple neurons *in vivo*, *Proceedings of the 26th Annual Meeting of the Society for Neuroscience*, New Orleans, LA, October 13-17, 2012

22) **S.B. Kodandaramaiah**, G. Talei Franzesi, N. Klapoetke, B. Chow, E. S. Boyden, C. R. Forest, New tools for the mechanistic dissection of neural networks: a robotic system for automated whole-cell patch *clamping in vivo* and optimized molecular reagents for multi-pathway optogenetic control. Collaborative Research in Computational Neuroscience (CRCNS) PI Meeting, Princeton University, Princeton, NJ, 2012

23) **S.B. Kodandaramaiah**, G. Talei Franzesi, B. Chow, E. S. Boyden, C. R. Forest, Automated whole-cell patch clamp electrophysiology of neurons *in vivo*, Collaborative Research in Computational Neuroscience (CRCNS) PI Meeting, Princeton University, Princeton, NJ, 2011

24) **S. B. Kodandaramaiah**, E.S. Boyden, C.R. Forest, Automated patch clamping of neurons in the mammalian brain *in vivo*, *Proceedings of the 25th Annual Meeting of the Society for Neuroscience*, Washington, DC, November 12-16, 2011

25) **S. B. Kodandaramaiah**, M. Krijnen, J. Go, S. Malik, J. P. Khatait, E. S. Boyden, R. G.K.M. Aarts, D. M. Brouwer and C. R. Forest, *Proceedings of the 25th Annual Meeting of the American Society for Precision Engineering*, Denver, CO, October 31-November 5, 2011

26) M.V. Baratta, **S. B. Kodandaramaiah**, P.E. Monahan, K. Kim, A. Yang, C.R. Forest, K.A. Goosens, E.S. Boyden, Effects of stress on aversive learning require temporally precise serotonergic signaling, *Proceedings of the 25th Annual Meeting of the Society for Neuroscience*, Washington, DC, November 12-16, 2011.

27) A.S. Chuong, M. Miri, X. Gu, **S. B. Kodandaramaiah**, M. Ogawa, L.C. Acker, N. Klapoetke, M. A. Henninger, C. R. Forest, B.Y. Chow, X. Han, J. Cardin, E.S. Boyden. Red-shifted optogenetic neural silencers: improvements and *in vivo* use for inactivation of large brain

volumes. *Proceedings of the 25th Annual Meeting of the Society for Neuroscience*, Washington, DC, November 12-16, 2011.

28) J. Scholvin, A. N. Zorzos, G. Talei Franzesi, **S. B. Kodandaramaiah**, B. D. Allen, J. Kinney, C. Moore-Kochlacs, A.C. Singer, S. Wasserman, C. Wentz, M. Yamaguchi, C.R. Forest, N. Kopell, C.G. Fonstad, E.S. Boyden, High channel-count silicon neural recording probes for 3d characterization of optogenetically modulated neural dynamics, *Proceedings of the 25th Annual Meeting of the Society for Neuroscience*, Washington, DC, November 12-16, 2011

Other Key Activities and Accomplishments

Patents Issued

1) **S. B. Kodandaramaiah**, E. S. Boyden, C. R. Forest, B.Y. Chow, G.T. Franzesi, Autopatcher: A robot for automated whole-cell patch clamp electrophysiology of neurons *in vivo*, **Issued: April 2017**

Patents Filed

1) Image-guided, closed-loop robotic system for automated whole-cell patch clamp electrophysiology of neurons *in vivo*
 Inventors: Ho-Jun Suk, Ed Boyden, Ingrid van Welie, Brian D Allen, Suhasa B Kodandaramaiah, Craig Forest.
 Filed: 7/6/2017
 MIT Docket No. 056754/1030
 U.S. Ser. No. 15/643,462

Provisional Patents Filed

1) Flexible and mechanically reconfigurable electrodes for spatiotemporally tuned neurostimulation
USSN: 62/577,367
Filed: October 26, 2017
Inventors: Suhasa B Kodandaramaiah, Gregory Johnson, Silvia Mangia, Lauri Lehto, Olli Grohn and Shalom Micheali
OTC Ref#: 920171.00178

2) Robotic platform for high throughput single cell gene manipulation in intact tissue
USSN.: 62/554,993
Filed: September 6, 2017
Inventors: Suhasa B Kodandaramaiah, Gabriella Shull, Weiland Huttner and Elena Taverna
OTC Ref#: 1008-211USP1

Invention Disclosures

TEACHING AND CURRICULUM DEVELOPMENT

University of Minnesota, Twin Cities

Spring 2018

ME 3281 – Modeling and control of dynamical systems

Course Credits: 4.00 – 3 hours of lecture, 1 hour of discussion

Fall 2018

ME 3281 – Modeling and control of dynamical systems

Course Credits: 4.00 – 3 hours of lecture, 1 hour of discussion

Massachusetts Institute of Technology

Neurotechnology in Action (Fall 2014)

Neuro-robotics lab instructor

Course Instructors: Edward S Boyden and Alan Yasanoff

Class of 24 students

- Developed laboratory module for teaching automated neural recordings
- Helped prepare lecture notes
- Developed video tutorials for broad dissemination

Georgia Institute of Technology, Atlanta, GA

Teaching Practicum for ME 4182: Capstone Design (Fall 2012)

Course Instructor: Craig Forest

Class of 150 students

- Coordinated functioning of the Invention Studio
- Designed lecture material
- Delivered lecture on Design for Manufacturing
- One on one mentoring of student teams on final design projects

ME 4182: Capstone Design (Spring 2010)

Teaching Assistant

Course Instructor: Craig Forest

Class of 160 students

- Coordinated functioning of the Invention Studio
- Organized the inter-department “Senior Design Expo”
- Mentored team “ μ -PIP” on pipette puller design and pipette tip characterization

University of Michigan, Ann Arbor, MI

ME 552: Mechatronics Systems Design (Fall 2008)

Teaching Assistant

Course instructor: Prof. Brent Gillespie

Class of 20 Students

- Prepared lecture notes, conducted office and laboratory hours
- Conducted Labview training workshop
- Developed new lecture material and course structure based on “Interpersonal Haptics” theme
- Mentored two class project teams: ‘SMA based Braille display’ and ‘Feel the music: Pneumatic haptic music system for the hearing impaired’
- Helped in organizing the “Interpersonal Haptics” design expo

University of Michigan, Ann Arbor, MI*ME 395: Mechanical Engineering Junior Laboratory Course (Winter 2008)*

Teaching Assistant

Course Instructors: Prof. Volker Sick, Prof Nikos Chronis and Prof. Leslie A. Olsen

Class of 150+ students

- Supervised two laboratory sections of 16 students each
- Conducted Laboratory training sessions
- Office hours 2 hours/week as well as grading assignments and examinations

Vishveshwaraiah Technological University, Belgaum, India*Undergraduate Teaching Assistantship, Solid Mechanics (2004)*

Course Instructor: Prof. K. S. Shridhar

- Prepared class notes, class presentations
- Formulated homework assignment problems

Vishveshwaraiah Technological University, Belgaum, India*Undergraduate Teaching Assistantship, Kinematics of Machines (2003)*

Course Instructor: Prof. L. Sunith Babu

- Prepared class notes, class presentations
- Grading Homework problems
- Conducted Lecture on 'Relative Velocity Methods'

ADVISING AND MENTORING**University of Minnesota, Twin Cities, MN****Graduate Student Activities****Completed Masters Thesis Advisees***M.S. Plan A*

Matthew Lavere Rynes (BME)

Doctoral Students Advised (Current)

Leila Ghanbari (Mechanical Engineering)

Gabiella Shull (Biomedical Engineering)

Masters Students Advised (Current)

Jay Jia Hu (Biomedical Engineering)

Undergraduate Student Activities

Lenora Haltom (Mechanical Engineering, Feb 2016 - April 2017)

Jia Hu (August 2016 – August 2018)

Micheal Laroque (Mechanical Engineering, September 2016 – current)

Nahom Mossazghi (Neuroscience, May 2017 – current)) McNair Fellow, MnDRIVE Northstar

Stem Alliance fellowship, NIH Undergraduate scholars fellowship

Judith Dominguez (Mechanical Engineering, March 2017-current)

Nick Dabiran (Mechanical Engineering, May 2017- current)

Justin Buschnyj (Mechanical Engineering, September 2017 – current)

Daniel Sousa Schulman (Mechanical Engineering, April 2017 – current)

Other Mentoring Activities

Preston Donaldson (Member of PhD Thesis Committee)
Chia-Hsing Pi (Member of PhD Thesis Committee)
Corey Cruttenden (Member of PhD Thesis Committee)
Mahdi Ahmadi (Member of PhD Thesis Committee)
Kelsey Devine (Member of MS Thesis Plan B Committee)

Massachusetts Institute of Technology, Cambridge, MA

Undergraduate Student Activities

Undergraduate research projects

Deniz C. Aksel
Eunice Wu
Bettina Arkhurst

Georgia Institute of Technology, Atlanta, GA

Undergraduate research projects

Jamison Go
Nikita Pak
Mike Dergance

Other Mentoring Activities

Boston University, Boston, MA

Caroline Moore Kochlacs, Boston University (PhD thesis committee member)

Georgia Institute of Technology, Atlanta, GA

Gregory B. Holst, Georgia Institute of Technology (PhD thesis committee member)

SERVICE AND PUBLIC OUTREACH

Service To The Discipline/Profession/Interdisciplinary Area(s)

Editorships/Journal Reviewer Experience

Journal article peer-reviewer, ASME Journal of Biomechanical Engineering (Aug 2017)
Journal article peer-reviewer, Journal of Neurophysiology (Jun 2015)
Journal article peer-reviewer, IEEE Transactions on Automation Science and Engineering (Jan 2015)
Journal article peer-reviewer, Journal of Biomedical Microdevices (Sep 2015)

Review panels for external funding agencies, foundations, etc.

Member of abstract review panel, Biomedical Engineering Society (Jun 2017)
Member of abstract review panel, Biomedical Engineering Society (Sep 2014)

Service To The University/College/Department

University of Minnesota

Collegiate Service and Intercollegiate Service

MnDRIVE RSAM outreach committee member (Jan 2017 – current)

University of Minnesota Informatics Institute MnDRIVE fellowship review committee member
(December 2017 – current)