

Stephen Ryu, MD

Adjunct Clinical Professor, Neurosurgery

Bio

LINKS

- PAMF Neurosurgery Profile: <http://pamf.org/neurosurgery/team/ryus.html>

Publications

PUBLICATIONS

- **Inferring single-trial neural population dynamics using sequential auto-encoders** *NATURE METHODS*
Pandarinath, C., O'Shea, D. J., Collins, J., Jozefowicz, R., Stavisky, S. D., Kao, J. C., Trautmann, E. M., Kaufman, M. T., Ryu, S. I., Hochberg, L. R., Henderson, J. M., Shenoy, K. V., Abbott, et al
2018; 15 (10): 805+
- **Learning by neural reassociation** *NATURE NEUROSCIENCE*
Golub, M. D., Sadtler, P. T., Oby, E. R., Quick, K. M., Ryu, S. I., Tyler-Kabara, E. C., Batista, A. P., Chase, S. M., Yu, B. M.
2018; 21 (4): 607+
- **Feasibility Analysis of Genetically-Encoded Calcium Indicators as a Neural Signal Source for All-Optical Brain-Machine Interfaces**
Sun, X., Kao, J. C., Marshel, J. H., Ryu, S. I., Shenoy, K. V., IEEE
IEEE.2017: 174–80
- **Making brain-machine interfaces robust to future neural variability** *NATURE COMMUNICATIONS*
Sussillo, D., Stavisky, S. D., Kao, J. C., Ryu, S. I., Shenoy, K. V.
2016; 7
- **Neural constraints on learning** *NATURE*
Sadtler, P. T., Quick, K. M., Golub, M. D., Chase, S. M., Ryu, S. I., Tyler-Kabara, E. C., Yu, B. M., Batista, A. P.
2014; 512 (7515): 423-U428
- **Cortical activity in the null space: permitting preparation without movement.** *Nature neuroscience*
Kaufman, M. T., Churchland, M. M., Ryu, S. I., Shenoy, K. V.
2014; 17 (3): 440-448
- **Neural Dynamics of Reaching following Incorrect or Absent Motor Preparation** *NEURON*
Ames, K. C., Ryu, S. I., Shenoy, K. V.
2014; 81 (2): 438-451
- **A high-performance neural prosthesis enabled by control algorithm design** *NATURE NEUROSCIENCE*
Gilja, V., Nuyujukian, P., Chestek, C. A., Cunningham, J. P., Yu, B. M., Fan, J. M., Churchland, M. M., Kaufman, M. T., Kao, J. C., Ryu, S. I., Shenoy, K. V.
2012; 15 (12): 1752-1757
- **Neural population dynamics during reaching** *NATURE*
Churchland, M. M., Cunningham, J. P., Kaufman, M. T., Foster, J. D., Nuyujukian, P., Ryu, S. I., Shenoy, K. V.
2012; 487 (7405): 51-?
- **Single-Trial Neural Correlates of Arm Movement Preparation** *NEURON*
Afshar, A., Santhanam, G., Yu, B. M., Ryu, S. I., Sahani, M., Shenoy, K. V.

2011; 71 (3): 555-564

- **Stimulus onset quenches neural variability: a widespread cortical phenomenon** *NATURE NEUROSCIENCE*
Churchland, M. M., Yu, B. M., Cunningham, J. P., Sugrue, L. P., Cohen, M. R., Corrado, G. S., Newsome, W. T., Clark, A. M., Hosseini, P., Scott, B. B., Bradley, D. C., Smith, M. A., Kohn, et al
2010; 13 (3): 369-U25
- **A high-performance brain-computer interface** *NATURE*
Santhanam, G., Ryu, S. I., Yu, B. M., Afshar, A., Shenoy, K. V.
2006; 442 (7099): 195-198
- **Brain-machine interface cursor position only weakly affects monkey and human motor cortical activity in the absence of arm movements.** *Scientific reports*
Stavisky, S. D., Kao, J. C., Nuyujukian, P., Pandarinath, C., Blabe, C., Ryu, S. I., Hochberg, L. R., Henderson, J. M., Shenoy, K. V.
2018; 8 (1): 16357
- **Development of an optogenetic toolkit for neural circuit dissection in squirrel monkeys** *SCIENTIFIC REPORTS*
O'Shea, D. J., Kalanithi, P., Ferenczi, E. A., Hsueh, B., Chandrasekaran, C., Goo, W., Diester, I., Ramakrishnan, C., Kaufman, M. T., Ryu, S. I., Yeom, K. W., Deisseroth, K., Shenoy, et al
2018; 8: 6775
- **Neural Population Dynamics Underlying Motor Learning Transfer** *NEURON*
Vyas, S., Even-Chen, N., Stavisky, S. D., Ryu, S. I., Nuyujukian, P., Shenoy, K. V.
2018; 97 (5): 1177-+
- **Unsupervised Discovery of Demixed, Low-Dimensional Neural Dynamics across Multiple Timescales through Tensor Component Analysis.** *Neuron*
Williams, A. H., Kim, T. H., Wang, F. n., Vyas, S. n., Ryu, S. I., Shenoy, K. V., Schnitzer, M. n., Kolda, T. G., Ganguli, S. n.
2018
- **A High-Performance Neural Prosthesis Incorporating Discrete State Selection With Hidden Markov Models** *IEEE TRANSACTIONS ON BIOMEDICAL ENGINEERING*
Kao, J. C., Nuyujukian, P., Ryu, S. I., Shenoy, K. V.
2017; 64 (4): 935-945
- **Trial-by-Trial Motor Cortical Correlates of a Rapidly Adapting Visuomotor Internal Model.** *journal of neuroscience*
Stavisky, S. D., Kao, J. C., Ryu, S. I., Shenoy, K. V.
2017; 37 (7): 1721-1732
- **The need for calcium imaging in nonhuman primates: New motor neuroscience and brain-machine interfaces** *EXPERIMENTAL NEUROLOGY*
O'Shea, D. J., Tiautmann, E., Chandrasekaran, C., Stavisky, S., Kao, J. C., Sahani, M., Ryu, S., Deisseroth, K., Shenoy, K. V.
2017; 287: 437-451
- **Augmenting intracortical brain-machine interface with neurally driven error detectors.** *Journal of neural engineering*
Even-Chen, N. n., Stavisky, S. D., Kao, J. C., Ryu, S. I., Shenoy, K. V.
2017; 14 (6): 066007
- **A Nonhuman Primate Brain-Computer Typing Interface** *PROCEEDINGS OF THE IEEE*
Nuyujukian, P., Kao, J. C., Ryu, S. I., Shenoy, K. V.
2017; 105 (1): 66-72
- **Tensor Analysis Reveals Distinct Population Structure that Parallels the Different Computational Roles of Areas M1 and V1.** *PLoS computational biology*
Seely, J. S., Kaufman, M. T., Ryu, S. I., Shenoy, K. V., Cunningham, J. P., Churchland, M. M.
2016; 12 (11)
- **Single-unit activity, threshold crossings, and local field potentials in motor cortex differentially encode reach kinematics** *JOURNAL OF NEUROPHYSIOLOGY*
Perel, S., Sadtler, P. T., Oby, E. R., Ryu, S. I., Tyler-Kabara, E. C., Batista, A. P., Chase, S. M.
2015; 114 (3): 1500-1512

- **Single-trial dynamics of motor cortex and their applications to brain-machine interfaces** *NATURE COMMUNICATIONS*
Kao, J. C., Nuyujukian, P., Ryu, S. I., Churchland, M. M., Cunningham, J. P., Shenoy, K. V.
2015; 6
- **A high performing brain-machine interface driven by low-frequency local field potentials alone and together with spikes.** *Journal of neural engineering*
Stavisky, S. D., Kao, J. C., Nuyujukian, P., Ryu, S. I., Shenoy, K. V.
2015; 12 (3): 036009-?
- **A high performing brain-machine interface driven by low-frequency local field potentials alone and together with spikes** *JOURNAL OF NEURAL ENGINEERING*
Stavisky, S. D., Kao, J. C., Nuyujukian, P., Ryu, S. I., Shenoy, K. V.
2015; 12 (3)
- **Natural Grouping of Neural Responses Reveals Spatially Segregated Clusters in Prearcuate Cortex** *NEURON*
Kiani, R., Cueva, C. J., Reppas, J. B., Peixoto, D., Ryu, S. I., Newsome, W. T.
2015; 85 (6): 1359-1373
- **Comparison of spike sorting and thresholding of voltage waveforms for intracortical brain-machine interface performance.** *Journal of neural engineering*
Christie, B. P., Tat, D. M., Irwin, Z. T., Gilja, V., Nuyujukian, P., Foster, J. D., Ryu, S. I., Shenoy, K. V., Thompson, D. E., Chestek, C. A.
2015; 12 (1): 016009-?
- **Comparison of spike sorting and thresholding of voltage waveforms for intracortical brain-machine interface performance.** *Journal of neural engineering*
Christie, B. P., Tat, D. M., Irwin, Z. T., Gilja, V., Nuyujukian, P., Foster, J. D., Ryu, S. I., Shenoy, K. V., Thompson, D. E., Chestek, C. A.
2015; 12 (1): 016009-?
- **Brain-computer interface control along instructed paths.** *Journal of neural engineering*
Sadtler, P. T., Ryu, S. I., Tyler-Kabara, E. C., Yu, B. M., Batista, A. P.
2015; 12 (1): 016015-?
- **A High-Performance Keyboard Neural Prosthesis Enabled by Task Optimization** *IEEE TRANSACTIONS ON BIOMEDICAL ENGINEERING*
Nuyujukian, P., Fan, J. M., Kao, J. C., Ryu, S. I., Shenoy, K. V.
2015; 62 (1): 21-29
- **Single-trial dynamics of motor cortex and their applications to brain-machine interfaces.** *Nature communications*
Kao, J. C., Nuyujukian, P., Ryu, S. I., Churchland, M. M., Cunningham, J. P., Shenoy, K. V.
2015; 6: 7759-?
- **Vacillation, indecision and hesitation in moment-by-moment decoding of monkey motor cortex.** *eLife*
Kaufman, M. T., Churchland, M. M., Ryu, S. I., Shenoy, K. V.
2015; 4
- **Performance sustaining intracortical neural prostheses.** *Journal of neural engineering*
Nuyujukian, P., Kao, J. C., Fan, J. M., Stavisky, S. D., Ryu, S. I., Shenoy, K. V.
2014; 11 (6): 066003-?
- **Performance sustaining intracortical neural prostheses** *JOURNAL OF NEURAL ENGINEERING*
Nuyujukian, P., Kao, J. C., Fan, J. M., Stavisky, S. D., Ryu, S. I., Shenoy, K. V.
2014; 11 (6)
- **A freely-moving monkey treadmill model** *JOURNAL OF NEURAL ENGINEERING*
Foster, J. D., Nuyujukian, P., Freifeld, O., Gao, H., Walker, R., Ryu, S. I., Meng, T. H., Murmann, B., Black, M. J., Shenoy, K. V.
2014; 11 (4)
- **Self-recalibrating classifiers for intracortical brain-computer interfaces.** *Journal of neural engineering*
Bishop, W., Chestek, C. C., Gilja, V., Nuyujukian, P., Foster, J. D., Ryu, S. I., Shenoy, K. V., Yu, B. M.
2014; 11 (2): 026001-?

- **Self-recalibrating classifiers for intracortical brain-computer interfaces.** *Journal of neural engineering*
Bishop, W., Chestek, C. C., Gilja, V., Nuyujukian, P., Foster, J. D., Ryu, S. I., Shenoy, K. V., Yu, B. M.
2014; 11 (2): 026001-?
- **Intention estimation in brain-machine interfaces.** *Journal of neural engineering*
Fan, J. M., Nuyujukian, P., Kao, J. C., Chestek, C. A., Ryu, S. I., Shenoy, K. V.
2014; 11 (1): 016004-?
- **Hybrid decoding of both spikes and low-frequency local field potentials for brain-machine interfaces.** *Conference proceedings : ... Annual International Conference of the IEEE Engineering in Medicine and Biology Society. IEEE Engineering in Medicine and Biology Society. Annual Conference*
Stavisky, S. D., Kao, J. C., Nuyujukian, P., Ryu, S. I., Shenoy, K. V.
2014; 2014: 3041-3044
- **DataHigh: graphical user interface for visualizing and interacting with high-dimensional neural activity.** *Journal of neural engineering*
Cowley, B. R., Kaufman, M. T., Butler, Z. S., Churchland, M. M., Ryu, S. I., Shenoy, K. V., Yu, B. M.
2013; 10 (6): 066012-?
- **DataHigh: graphical user interface for visualizing and interacting with high-dimensional neural activity.** *Journal of neural engineering*
Cowley, B. R., Kaufman, M. T., Butler, Z. S., Churchland, M. M., Ryu, S. I., Shenoy, K. V., Yu, B. M.
2013; 10 (6): 066012-?
- **Investigating the role of firing-rate normalization and dimensionality reduction in brain-machine interface robustness.** *Conference proceedings : ... Annual International Conference of the IEEE Engineering in Medicine and Biology Society. IEEE Engineering in Medicine and Biology Society. Conference*
Kao, J. C., Nuyujukian, P., Stavisky, S., Ryu, S. I., Ganguli, S., Shenoy, K. V.
2013; 2013: 293-298
- **Design and validation of a real-time spiking-neural-network decoder for brain-machine interfaces.** *Journal of neural engineering*
Dethier, J., Nuyujukian, P., Ryu, S. I., Shenoy, K. V., Boahen, K.
2013; 10 (3): 036008-?
- **Design and validation of a real-time spiking-neural-network decoder for brain-machine interfaces.** *Journal of neural engineering*
Dethier, J., Nuyujukian, P., Ryu, S. I., Shenoy, K. V., Boahen, K.
2013; 10 (3): 036008-?
- **Direction and Speed Tuning of Motor-Cortex Multi-Unit Activity and Local Field Potentials During Reaching Movements** *35th Annual International Conference of the IEEE-Engineering-in-Medicine-and-Biology-Society (EMBC)*
Perel, S., Sadtler, P. T., Godlove, J. M., Ryu, S. I., Wang, W., Batista, A. P., Chase, S. M.
IEEE.2013: 299–302
- **An L (1)-regularized logistic model for detecting short-term neuronal interactions** *JOURNAL OF COMPUTATIONAL NEUROSCIENCE*
Zhao, M., Batista, A., Cunningham, J. P., Chestek, C., Rivera-Alvidrez, Z., Kalmar, R., Ryu, S., Shenoy, K., Iyengar, S.
2012; 32 (3): 479-497
- **A recurrent neural network for closed-loop intracortical brain-machine interface decoders** *JOURNAL OF NEURAL ENGINEERING*
Sussillo, D., Nuyujukian, P., Fan, J. M., Kao, J. C., Stavisky, S. D., Ryu, S., Shenoy, K.
2012; 9 (2)
- **A brain machine interface control algorithm designed from a feedback control perspective** *34th Annual International Conference of the IEEE Engineering-in-Medicine-and-Biology-Society (EMBS)*
Gilja, V., Nuyujukian, P., Chestek, C. A., Cunningham, J. P., Yu, B. M., Fan, J. M., Ryu, S. I., Shenoy, K. V.
IEEE.2012: 1318–1322
- **A framework for relating neural activity to freely moving behavior** *34th Annual International Conference of the IEEE Engineering-in-Medicine-and-Biology-Society (EMBS)*
Foster, J. D., Nuyujukian, P., Freifeld, O., Ryu, S. I., Black, M. J., Shenoy, K. V.
IEEE.2012: 2736–2739
- **A framework for relating neural activity to freely moving behavior** *34th Annual International Conference of the IEEE Engineering-in-Medicine-and-Biology-Society (EMBS)*

- Foster, J. D., Nuyujukian, P., Freifeld, O., Ryu, S. I., Black, M. J., Shenoy, K. V.
IEEE.2012: 2736–2739
- **Long-term stability of neural prosthetic control signals from silicon cortical arrays in rhesus macaque motor cortex** *39th Neural Interfaces Conference (NIC2010)*
Chestek, C. A., Gilja, V., Nuyujukian, P., Foster, J. D., Fan, J. M., Kaufman, M. T., Churchland, M. M., Rivera-Alvidrez, Z., Cunningham, J. P., Ryu, S. I., Shenoy, K. V.
IOP PUBLISHING LTD.2011
 - **A closed-loop human simulator for investigating the role of feedback control in brain-machine interfaces** *JOURNAL OF NEUROPHYSIOLOGY*
Cunningham, J. P., Nuyujukian, P., Gilja, V., Chestek, C. A., Ryu, S. I., Shenoy, K. V.
2011; 105 (4): 1932-1949
 - **Combining Wireless Neural Recording and Video Capture for the Analysis of Natural Gait** *5th International IEEE Engineering-in-Medicine-and-Biology-Society (EMBS) Conference on Neural Engineering (NER)*
Foster, J. D., Freifeld, O., Nuyujukian, P., Ryu, S. I., Black, M. J., Shenoy, K. V.
IEEE.2011: 613–616
 - **High-performance neural prosthetic control along instructed paths** *5th International IEEE Engineering-in-Medicine-and-Biology-Society (EMBS) Conference on Neural Engineering (NER)*
Sadtler, P. T., Ryu, S. I., Yu, B. M., Batista, A. P.
IEEE.2011: 601–604
 - **Cortical Preparatory Activity: Representation of Movement or First Cog in a Dynamical Machine?** *NEURON*
Churchland, M. M., Cunningham, J. P., Kaufman, M. T., Ryu, S. I., Shenoy, K. V.
2010; 68 (3): 387-400
 - **Pituitary Adenomas Can Appear as Hypermetabolic Lesions in 18F-FDG PET Imaging** *JOURNAL OF NEUROIMAGING*
Ryu, S. I., Tafti, B. A., Skirboll, S. L.
2010; 20 (4): 393-396
 - **Roles of Monkey Premotor Neuron Classes in Movement Preparation and Execution** *JOURNAL OF NEUROPHYSIOLOGY*
Kaufman, M. T., Churchland, M. M., Santhanam, G., Yu, B. M., Afshar, A., Ryu, S. I., Shenoy, K. V.
2010; 104 (2): 799-810
 - **Low-Dimensional Neural Features Predict Muscle EMG Signals** *32nd Annual International Conference of the IEEE Engineering-in-Medicine-and-Biology-Society (EMBC 10)*
Rivera-Alvidrez, Z., Kalmar, R. S., Ryu, S. I., Shenoy, K. V.
IEEE.2010: 6027–6033
 - **Methods for estimating neural firing rates, and their application to brain-machine interfaces** *NEURAL NETWORKS*
Cunningham, J. P., Gilja, V., Ryu, S. I., Shenoy, K. V.
2009; 22 (9): 1235-1246
 - **Fracture-related Thoracic Kyphotic Deformity Correction by Single-stage Posterolateral Vertebrectomy With Circumferential Reconstruction and Stabilization Outcomes in 30 Cases** *JOURNAL OF SPINAL DISORDERS & TECHNIQUES*
Yoo, C., Ryu, S. I., Park, J.
2009; 22 (7): 492-501
 - **Factor-Analysis Methods for Higher-Performance Neural Prostheses** *JOURNAL OF NEUROPHYSIOLOGY*
Santhanam, G., Yu, B. M., Gilja, V., Ryu, S. I., Afshar, A., Sahani, M., Shenoy, K. V.
2009; 102 (2): 1315-1330
 - **HermesC: Low-Power Wireless Neural Recording System for Freely Moving Primates** *IEEE TRANSACTIONS ON NEURAL SYSTEMS AND REHABILITATION ENGINEERING*
Chestek, C. A., Gilja, V., Nuyujukian, P., Kier, R. J., Solzbacher, F., Ryu, S. I., Harrison, R. R., Shenoy, K. V.
2009; 17 (4): 330-338
 - **Wireless Neural Recording With Single Low-Power Integrated Circuit** *IEEE TRANSACTIONS ON NEURAL SYSTEMS AND REHABILITATION ENGINEERING*

Harrison, R. R., Kier, R. J., Chestek, C. A., Gilja, V., Nuyujukian, P., Ryu, S., Greger, B., Solzbacher, F., Shenoy, K. V.
2009; 17 (4): 322-329

- **Human cortical prostheses: lost in translation?** *NEUROSURGICAL FOCUS*
Ryu, S. I., Shenoy, K. V.
2009; 27 (1)
- **Gaussian-Process Factor Analysis for Low-Dimensional Single-Trial Analysis of Neural Population Activity** *JOURNAL OF NEUROPHYSIOLOGY*
Yu, B. M., Cunningham, J. P., Santhanam, G., Ryu, S. I., Shenoy, K. V., Sahani, M.
2009; 102 (1): 614-635
- **Neural Prosthetic Systems: Current Problems and Future Directions** *Annual International Conference of the IEEE-Engineering-in-Medicine-and-Biology-Society*
Chestek, C. A., Cunningham, J. P., Gilja, V., Nuyujukian, P., Ryu, S. I., Shenoy, K. V.
IEEE.2009: 3369–3375
- **Toward Optimal Target Placement for Neural Prosthetic Devices** *JOURNAL OF NEUROPHYSIOLOGY*
Cunningham, J. P., Yu, B. M., Gilja, V., Ryu, S. I., Shenoy, K. V.
2008; 100 (6): 3445-3457
- **Detecting neural-state transitions using hidden Markov models for motor cortical prostheses** *JOURNAL OF NEUROPHYSIOLOGY*
Kemere, C., Santhanam, G., Yu, B. M., Afshar, A., Ryu, S. I., Meng, T. H., Shenoy, K. V.
2008; 100 (4): 2441-2452
- **Cortical neural prosthesis performance improves when eye position is monitored** *IEEE TRANSACTIONS ON NEURAL SYSTEMS AND REHABILITATION ENGINEERING*
Batista, A. P., Yu, B. M., Santhanam, G., Ryu, S. I., Afshar, A., Shenoy, K. V.
2008; 16 (1): 24-31
- **Signal processing challenges for neural prostheses** *IEEE SIGNAL PROCESSING MAGAZINE*
Linderman, M. D., Santhanam, G., Kemere, C. T., Gilja, V., O'Driscoll, S., Yu, B. M., Afshar, A., Ryu, S. I., Shenoy, K. V., Meng, T. H.
2008; 25 (1): 18-28
- **An Efficient Approximation for the Real-Time Implementation of the Mixture of Trajectory Models Decoder** *IEEE Biomedical Circuits and Systems Conference - Intelligent Biomedical Systems*
Bishop, W., Yu, B. M., Santhanam, G., Afshar, A., Ryu, S. I., Shenoy, K. V.
IEEE.2008: 133–136
- **A Wireless Neural Interface for Chronic Recording** *IEEE Biomedical Circuits and Systems Conference - Intelligent Biomedical Systems*
Harrison, R. R., Kier, R. J., Kim, S., Rieth, L., Warren, D. J., Ledbetter, N. M., Clark, G. A., Solzbacher, F., Chestek, C. A., Gilja, V., Nuyujukian, P., Ryu, S. I., Shenoy, et al
IEEE.2008: 125–128
- **HermesC: RF wireless low-power neural recording system for freely behaving primates** *IEEE International Symposium on Circuits and Systems*
Chestek, C. A., Gija, V., Nuyujukian, P., Ryu, S. I., Shenoy, K. V., Kier, R. J., Solzbacher, F., Harrison, R. R.
IEEE.2008: 1752–1755
- **A Factor-Analysis decoder for high-performance neural prostheses** *33rd IEEE International Conference on Acoustics, Speech and Signal Processing*
Santhanam, G., Yu, B. M., Gilja, V., Ryu, S. I., Afshar, A., Sahani, M., Shenoy, K. V.
IEEE.2008: 5208–5211
- **Wireless neural signal acquisition with single low-power integrated circuit** *IEEE International Symposium on Circuits and Systems*
Harrison, R. R., Kier, R. J., Greger, B., Solzbacher, F., Chestek, C. A., Gija, V., Nuyujukian, P., Ryu, S. I., Shenoy, K. V.
IEEE.2008: 1748–1751
- **HermesB: A continuous neural recording system for freely behaving primates** *IEEE TRANSACTIONS ON BIOMEDICAL ENGINEERING*
Santhanam, G., Linderman, M. D., Gija, V., Afshar, A., Ryu, S. I., Meng, T. H., Shenoy, K. V.
2007; 54 (11): 2037-2050

- **Single-neuron stability during repeated reaching in macaque premotor cortex** *JOURNAL OF NEUROSCIENCE*
Chestek, C. A., Batista, A. P., Santhanam, G., Yu, B. M., Afshar, A., Cunningham, J. P., Gilja, V., Ryu, S. I., Churchland, M. M., Shenoy, K. V.
2007; 27 (40): 10742-10750
- **Free-paced high-performance brain-computer interfaces** *JOURNAL OF NEURAL ENGINEERING*
Achtman, N., Afshar, A., Santhanam, G., Yu, B. M., Ryu, S. I., Shenoy, K. V.
2007; 4 (3): 336-347
- **Reference frames for reach planning in macaque dorsal premotor cortex** *JOURNAL OF NEUROPHYSIOLOGY*
Batista, A. P., Santhanam, G., Yu, B. M., Ryu, S. I., Afshar, A., Shenoy, K. V.
2007; 98 (2): 966-983
- **Mixture of trajectory models for neural decoding of goal-directed movements** *JOURNAL OF NEUROPHYSIOLOGY*
Yu, B. M., Kemere, C., Santhanam, G., Afshar, A., Ryu, S. I., Meng, T. H., Sahani, M., Shenoy, K. V.
2007; 97 (5): 3763-3780
- **Comparison of the biomechanical stability of dense cancellous allograft with tricortical iliac autograft and fibular allograft for cervical interbody fusion** *EUROPEAN SPINE JOURNAL*
Ryu, S. I., Lim, J. T., Kim, S., Paterno, J., Kim, D. H.
2006; 15 (9): 1339-1345
- **Neural variability in premotor cortex provides a signature of motor preparation** *JOURNAL OF NEUROSCIENCE*
Churchland, M. M., Yu, B. M., Ryu, S. I., Santhanam, G., Shenoy, K. V.
2006; 26 (14): 3697-3712
- **A prospective randomized study comparing a cervical carbon fiber cage to the Smith-Robinson technique with allograft and plating: up to 24 months follow-up** *EUROPEAN SPINE JOURNAL*
Ryu, S. I., Mitchell, M., Kim, D. H.
2006; 15 (2): 157-164
- **Increasing the performance of cortically-controlled prostheses.** *Conference proceedings : ... Annual International Conference of the IEEE Engineering in Medicine and Biology Society. IEEE Engineering in Medicine and Biology Society. Conference*
Shenoy, K. V., Santhanam, G., Ryu, S. I., Afshar, A., Yu, B. M., Gilja, V., Linderman, M. D., Kalmar, R. S., Cunningham, J. P., Kemere, C. T., Batista, A. P., Churchland, M. M., Meng, et al
2006: 6652-6656
- **Neural rklecording stability of chronic electrode arrays in freely behaving primates** *28th Annual International Conference of the IEEE-Engineering-in-Medicine-and-Biology-Society*
Linderman, M. D., Gilja, V., Santhanam, G., Afshar, A., Ryu, S., Meng, T. H., Shenoy, K. V.
IEEE.2006: 3784-3788
- **An autonomous, broadband, multi-channel neural recording system for freely behaving primates** *28th Annual International Conference of the IEEE-Engineering-in-Medicine-and-Biology-Society*
Linderman, M. D., Gilja, V., Santhanam, G., Afshar, A., Ryu, S., Meng, T. H., Shenoy, K. V.
IEEE.2006: 3780-3783
- **Neural recording stability of chronic electrode arrays in freely behaving primates.** *Conference proceedings : ... Annual International Conference of the IEEE Engineering in Medicine and Biology Society. IEEE Engineering in Medicine and Biology Society. Conference*
Linderman, M. D., Gilja, V., Santhanam, G., Afshar, A., Ryu, S., Meng, T. H., Shenoy, K. V.
2006; 1: 4387-4391
- **An autonomous, broadband, multi-channel neural recording system for freely behaving primates.** *Conference proceedings : ... Annual International Conference of the IEEE Engineering in Medicine and Biology Society. IEEE Engineering in Medicine and Biology Society. Conference*
Linderman, M. D., Gilja, V., Santhanam, G., Afshar, A., Ryu, S., Meng, T. H., Shenoy, K. V.
2006; 1: 1212-1215
- **Multiday electrophysiological recordings from freely behaving primates.** *Conference proceedings : ... Annual International Conference of the IEEE Engineering in Medicine and Biology Society. IEEE Engineering in Medicine and Biology Society. Conference*
Gilja, V., Linderman, M. D., Santhanam, G., Afshar, A., Ryu, S., Meng, T. H., Shenoy, K. V.
2006; 1: 5643-5646

- **A high performance neurally-controlled cursor positioning system** *2nd International IEEE/EMBS Conference on Neural Engineering*
Santhanam, G., Ryu, S. I., Yu, B. M., Afshar, A., Shenoy, K. V.
IEEE.2005: 494–500
- **Improving neural prosthetic system performance by combining plan and peri-movement activity.** *Conference proceedings : ... Annual International Conference of the IEEE Engineering in Medicine and Biology Society. IEEE Engineering in Medicine and Biology Society. Conference*
Yu, B. M., Ryu, S. I., Santhanam, G., Churchland, M. M., Shenoy, K. V.
2004; 6: 4516–4519
- **An extensible infrastructure for fully automated spike sorting during online experiments.** *Conference proceedings : ... Annual International Conference of the IEEE Engineering in Medicine and Biology Society. IEEE Engineering in Medicine and Biology Society. Conference*
Santhanam, G., Sahani, M., Ryu, S., Shenoy, K.
2004; 6: 4380–4384
- **Improving neural prosthetic system performance by combining plan and peri-movement activity** *26th Annual International Conference of the IEEE-Engineering-in-Medicine-and-Biology-Society*
Yu, B. A., Ryu, S. I., Santhanam, G., Churchland, M. M., Shenoy, K. V.
IEEE.2004: 4516–4519
- **An extensible infrastructure for fully automated spike sorting during online experiments** *26th Annual International Conference of the IEEE-Engineering-in-Medicine-and-Biology-Society*
Santhanam, G., Sahani, M., Ryu, S. I., Shenoy, K. V.
IEEE.2004: 4380–4384
- **Model-based decoding of reaching movements for prosthetic systems** *26th Annual International Conference of the IEEE-Engineering-in-Medicine-and-Biology-Society*
Kemere, C., Santhanam, G., Yu, B. M., Ryu, S., Meng, T., Shenoy, K. V.
IEEE.2004: 4524–4528
- **Model-based decoding of reaching movements for prosthetic systems.** *Conference proceedings : ... Annual International Conference of the IEEE Engineering in Medicine and Biology Society. IEEE Engineering in Medicine and Biology Society. Conference*
Kemere, C., Santhanam, G., Yu, B. M., Ryu, S., Meng, T., Shenoy, K. V.
2004; 6: 4524–4528
- **Asymptomatic transient MRI signal changes after unilateral deep brain stimulation electrode implantation for movement disorder** *STEREOTACTIC AND FUNCTIONAL NEUROSURGERY*
Ryu, S. I., Romanelli, P., Heit, G.
2004; 82 (2-3): 65–69
- **Stereotactic radiosurgery for hemangiomas and ependymomas of the spinal cord.** *Neurosurgical focus*
Ryu, S. I., Kim, D. H., Chang, S. D.
2003; 15 (5): E10–?
- **Surgical management and results of 135 tibial nerve lesions at the Louisiana State University Health Sciences Center** *NEUROSURGERY*
Kim, D. H., Cho, Y. J., Ryu, S., Tie, R. L., Kline, D. G.
2003; 53 (5): 1114–1124
- **Image-guided spinal stereotactic radiosurgery** *TECHNIQUES IN NEUROSURGERY*
Ryu, S. I., Kim, D. H., Martin, D. P., Chang, S. D., Adler, J. R.
2003; 8 (1): 56–64
- **Influence of movement speed on plan activity in monkey pre-motor cortex and implications for high-performance neural prosthetic system design** *25th Annual International Conference of the IEEE-Engineering-in-Medicine-and-Biology-Society*
Shenoy, K. V., Churchland, M. M., Santhanam, G., Yu, B. M., Ryu, S. I.
IEEE.2003: 1897–1900
- **Image-guided hypo-fractionated stereotactic radiosurgery to spinal lesions** *NEUROSURGERY*
Ryu, S. I., Chang, S. D., Kim, D. H., MURPHY, M. J., Le, Q. T., Martin, D. P., Adler, J. R.
2001; 49 (4): 838–846
- **Posterior cerebral circulation revascularization** *NEUROSURGERY CLINICS OF NORTH AMERICA*

Chang, S. D., Ryu, S. I., Steinberg, G. K.
2001; 12 (3): 519-?