



**CENTER** *for*  
**NEUROTECHNOLOGY**

*a National Science Foundation Engineering Research Center*

Member Publications  
October 2011 – March 2023

■ Publications supported directly by CNT funding

2017

- Hennessy, A. and Alimohammad, A. (2017). Design and implementation of a digital secure code-shifted reference UWB transmitter and receiver. *IEEE Transactions on Circuits and Systems I: Regular Papers*, 64(7), 1927-1936.

2018

- Bhagat, N., Valencia, D., Alimohammad, A., and Harris, F. (2018). High-throughput and compact FFT architectures using the Good-Thomas and Winograd algorithms. *IET Communications*, 12(8), 1011-1018.
- Shinde, V., Kumar, G. J., Valencia, D., and Alimohammad, A. (2018). High-throughput and compact reconfigurable architectures for recursive filters. *IET Communications*, 12(13), 1616-1623.

2019

- Korat, U.A., Alimohammad, A. A reconfigurable hardware architecture for principal component analysis. *Circuits Syst Signal Process* 38, 2097–2113 (2019). <https://doi.org/10.1007/s00034-018-0953-y>
- Valencia, D. and Alimohammad, A. Compact and high-throughput parameterizable architectures for memory-based FFT algorithms, *IET Circuits, Devices, and Systems*. 13 (5):696, 2019. <http://dx.doi.org/10.1049/iet-cds.2018.5556>
- Valencia, D. and Alimohammad, A. An efficient hardware architecture for template matching-based spike sorting, *IEEE Transactions on Biomedical Circuits and Systems*, 13:481-492, 2019.
- Valencia, D., Thies, J. and Alimohammad, A. Frameworks for efficient brain-computer interfacing, *IEEE Transactions on Biomedical Circuits and Systems*, October 14, 2019, DOI: 10.1109/TBCAS.2019.2947130.
- Valencia, D. and Alimohammad, A. A real-time spike sorting system using parallel OSort clustering, *IEEE Transactions on Biomedical Circuits and Systems*, 13(6): 1700-1713, 2019.
- Thies, J. and Alimohammad, A., Compact and low-power neural spike compression using undercomplete autoencoders, *IEEE Transactions on Neural Systems and Rehabilitation Engineering* , 27: 1529-1538, 2019.

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- Valencia, D., Fard, S.F. and Alimohammad, A. An artificial neural network processor with a custom instruction set architecture for embedded applications, *IEEE Transactions on Circuits and Systems I: Regular Papers*, 2020.
- Valencia, D. and Alimohammad, A. Neural spike sorting using binarized neural networks. *IEEE Trans Neural Syst Rehabil Eng*. 2020 Dec 9;PP. doi: 10.1109/TNSRE.2020.3043403. Epub ahead of print. PMID: 33296305.

2022

- Valencia, D. and Alimohammad, A. Towards in vivo neural decoding. *Biomed. Eng. Lett.* (2022). <https://doi.org/10.1007/s13534-022-00217-z>
- Valencia, D., Mercier, P.P. Alimohammad, A. In vivo neural spike detection with adaptive noise estimation.

J. Neural Eng., 19:4, 2022.

- Valencia, D. and Alimohammad, A. Partially binarized neural networks for efficient spike sorting. Biomed. Eng. Lett. (2022). <https://doi.org/10.1007/s13534-022-00255-7>

2023

- Valencia, D., Leone, G., Keller, N., Mercier, P.P., and Alimohammad, A. Power-efficient in vivo brain-machine interfaces via brain-state estimation. J. Neural Eng. 20 016032, DOI 10.1088/1741-2552/acb385, 2023.

Richard Andersen

2017

- Zhang, C.Y., Aflalo, T., Revechkis, B., Rosario, E.R., Ouellette, D., Pouratian, N. and Andersen, R.A. Partially mixed selectivity in human posterior parietal association cortex. Neuron, 95:697-708, 2017.

2018

- Armenta Salas, M., Bashford, L. Kellis, S., Jafari, M., Jo, H., Kramer, D., Shanfield, K., Pejsa, K., Lee, B., Liu, C.Y., Andersen, R.A. and Romo, R. Proprioceptive and cutaneous sensations in humans elicited by intracortical microstimulation. eLife 2018;7:e32904, DOI: 10.7554/eLife.32904.
- Lee, B., Kramer, D., Armenta Salas, M., Kellis, S., Brown, D., Dobрева, T., Klaes, C., Heck, C., Liu, C. and Andersen, R. A. (2018). Engineering artificial somatosensation through cortical stimulation in humans. Frontiers in Systems Neuroscience, 12, 24. doi:10.3389/fnsys.2018.00024

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- Saif-ur-Rehman, M., Lienkämper, R., Parpaley, Y., Wellmer, J., Liu, C., Lee, B., Kellis, S., Andersen, R., Iossifidis, I., Glasmachers, T. and Christian Klaes. SpikeDeeptector: a deep-learning based method for detection of neural spiking activity, J. Neural Eng. 16 (2019)
- Kramer, D.R., Kellis, S., Barbaro, M., Salas, M.A., Nune, G., Liu, C.Y., Andersen, R.A. and Lee, B. Technical considerations for generating somatosensation via cortical stimulation in a closed-loop sensory/motor brain-computer interface system in humans. Journal of Clinical Neuroscience, 63:116-121, 2019.
- Wang, P.T., Camacho, E., Wang, M., Li, Y., Shaw, S.J., Armacost, M., Gong, H., Kramer, D., Lee, B., Andersen, R.A. and Liu, C.Y. A benchtop system to assess the feasibility of a fully independent and implantable brain-machine interface. Journal of neural engineering, 16(6), p.066043. (2019).
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Polina Anikeeva

2011

- Anikeeva, P., Andalman, A.S., Witten, I., Warden, M., Goshen, I., Grosenick, L., Gunaydin, L.A., Frank, L.M. and Deisseroth, K. Optetrode: a multichannel readout for optogenetic control in freely moving mice. *Nat. Neurosci.*, 15:163-170, 2011.

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- Anikeeva, P. and Deisseroth, K. Photothermal genetic engineering. *ACS Nano*, 6:7548-7552, 2012.

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- Liske, H., Towne, C., Anikeeva, P., Zhao, S., Feng, G., Deisseroth, K. and Delp, S. Optical inhibition of motor nerve and muscle activity *in vivo*. *Muscle and Nerve*, 47:916-921, 2013.
- Chen, R., Christiansen, M.G. and Anikeeva, P. Maximizing hysteretic losses in magnetic ferrite nanoparticles via model-driven synthesis and materials optimization. *ACS Nano*, 7:8990-9000, 2013.

2014

- Birmingham, K., Gradinaru, V., Anikeeva, P., Grill, W.M., Pikov, V., McLaughlin, B., Pasricha, P., Weber, D., Ludwig, K., Famm, K. Bioelectronic medicines: a research roadmap. *Nat Rev Drug Discov.*, 13:399-400, 2014.
- Lu, C., Froriep, U. P., Koppes, R. A., Canales, A., Caggiano, V., Selvidge, J., Bizzi, E. and Anikeeva, P. Polymer fiber probes enable optical control of spinal cord and muscle function *in vivo*. *Adv. Funct. Mater.* 24: 6594–6600, 2014.
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- Anikeeva, P. and Jia, X. Remote-controlled mice. *Cell Systems*, 1:104-105, 2015.

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- Koppes, R.A., Park, S., Hood, T., Jia, X., Poorheravi, N.A., Achyuta, A.H., Fink, Y. and Anikeeva, P. Thermally drawn fibers as nerve guidance scaffolds. *Biomaterials*, 81:27-35, 2016.
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#### Askkan Ashrafi

2013

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#### Scott Bellman

2014

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#### Timothy Brown

2020

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### Bing Brunton

2015

- Kopec, C.D., Erlich, J.C., Brunton, B.W., Deisseroth, K. and Brody, C.D. Cortical and subcortical contributions to short-term memory for orienting movements. *Neuron*, 88:367-377, 2015.
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### Howard Chizeck

2011

- Matlack, C., Chizeck, H.J., Davis, T.B. and Linnes, J. A low-cost solar disinfection indicator for safe water. *IEEE Global Humanitarian Technology Conference*, Seattle, Oct/Nov 2011.

2012

- Nia Kosari, S., Ramadurai, S., Chizeck, H.J. and Hannaford, B. Robotic compression of soft tissue. *Proc. 2012 IEEE International Conference on Robotics and Automation*, St. Paul-Minneapolis, May 2012.
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## 2014

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