

# CURRICULUM VITAE

## Christopher Lee Keown

### EDUCATION

- University of California, San Diego La Jolla, CA 2013-present
- Pursuing doctoral degree in cognitive sciences
- San Diego State University San Diego, CA, 2009-2013
- Masters in computational science
- Indiana University Bloomington, IN, 2003
- B.S. Computer Science; German Minor

### RESEARCH EXPERIENCE

#### **Graduate Research Assistant, Computational Neural Data and Dynamics Laboratory, UCSD, Eran Mukamel, PhD (2013 – present)**

- Currently examining how an enriched environment can confer protection against environmentally induced depression by identifying induced gene expression and epigenetic changes in the hippocampus.
- Analysis of regulatory mechanisms for sex differences in the brain, particularly in the context of X-inactivation and genomic imprinting.

#### **Graduate Research Assistant, Brain Development and Imaging Laboratory, San Diego State University, Ralph-Axel Müller, PhD, (2010 – 2013)**

- Used machine learning algorithms including classifiers and clustering algorithms to attempt to diagnose autism based on imaging data as well as explore for subtypes within the autism spectrum, both tasks important for early diagnosis and personalization of treatment
- Examined the synchronization of networks in autism compared to typically developing subjects, using independent component analysis to detect networks and graph theory to model their interactions in the temporal domain, and results suggested noisy communication between networks in autism.
- Implemented graph theoretical metrics to quantify both local and regional patterns of aberrant connectivity in autism spectrum disorders, finding evidence of both over- and underconnectivity in comparison with typically developing children.

### PUBLICATIONS

- **Keown, C.L.**, Datko, M.C., Chen, C.P., Maximo, J.O., Jahed, A., Müller, R.-A. (2016). Network organization is globally atypical in autism: A graph theory study of intrinsic functional connectivity. *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging* (accepted).

- Shen, M.D., Li, D.D., **Keown, C.L.**, Lee A., Johnson, R.T., Angkustsiri K., Rogers, S.J., Müller, R.-A., Amaral, D.G., Nordahl, C.W (2016). Functional Connectivity of the Amygdala Is Disrupted in Preschool-Aged Children With Autism Spectrum Disorder. *Journal of the American Academy of Child & Adolescent Psychiatry*.
- Chen, C.P., **Keown, C.L.**, Jahedi, A., Nair, A., Pflieger, M.E., Bailey, B.A., Müller, R.-A. (2015). Diagnostic classification of intrinsic functional connectivity highlights somatosensory, default mode, and visual regions in autism. *NeuroImage: Clinical*.
- Khan, A.J., Nair, A., **Keown, C.L.**, Datko, M.C., Lincoln, A.J., Müller, R.-A. (2015). Cerebro-cerebellar resting-state functional connectivity in children and adolescents with autism spectrum disorder. *Biological Psychiatry*.
- Abbott, A.E., Nair, A., **Keown, C.L.**, Datko, M. Jahedi, A., Fishman, I., CL Keown, M Datko, A Jahedi, I Fishman, Müller, R.-A. (2015). Patterns of Atypical Functional Connectivity and Behavioral Links in Autism Differ Between Default, Salience, and Executive Networks. *Cerebral Cortex*.
- Yick-Lun So, A., Chaudhuri, A.A., Sookram, R., Minisandram, A., Cheng, D., Xie, C., Lim, L., Flores, Y.G., Jiang, S., **Keown, C.L.**, Ramakrishnan, P., Baltimore, D. (2013). Dual mechanisms by which mir-125b represses IRF4 to cause myeloid and B-cell leukemia. *Blood*.
- Fishman, I., **Keown, C.L.**, Müller, R.-A. (2013). Atypical 'cross-talk' between mentalizing and mirror neuron networks in autism spectrum disorder. *JAMA Psychiatry*.
- **Keown, C.L.**, Nair, A., Datko, M., Shih, P., Keehn, B., Müller, R.-A. Impact of methodological variables on functional connectivity findings in autism spectrum disorders. *Human Brain Mapping*.
- **Keown, C.L.**, Shih, P., Nair, A., Peterson, N., Müller, R.-A. (2013). Local functional overconnectivity in posterior brain regions is associated with symptom severity in autism spectrum disorders. *Cell Reports* 5(3), 567-72.
- Maximo, J.O., **Keown, C.L.**, Nair, A., Müller, R.-A. (2013). Approaches to local connectivity in autism using resting state functional connectivity MRI. *Frontiers in Human Neuroscience* 7.
- Chen, C.P., **Keown, C.L.**, Müller, R.-A. (2013). Towards understanding autism risk factors: a classification of brain images with support vector machines. *International Journal of Semantic Computing* 7 (02): 205-13.
- Di Martino, A., ..., **Keown, C.L.**, ..., Milham, M.P. (2013). The autism brain imaging data exchange: towards a large-scale evaluation of the intrinsic brain architecture in autism. *Molecular Psychiatry*.
- Shih, P., Keehn, B., Oram, J.K., Leyden, K.M., **Keown, C.L.** & Müller, R.-A. (2011). Functional differentiation of posterior superior temporal sulcus in autism: A functional connectivity MRI study. *Biological Psychiatry* 70, 270-7.

## PUBLISHED REVIEWS

- R.-A. Müller, Shih, P., & **Keown, C. L.** (2012). A functional connectivity-based classification approach to autism spectrum disorder: Only as good (or bad) as available diagnostic criteria. *Future Neurology* 7, 3, 259-263.

## ORAL PRESENTATIONS

- **Keown, C.L.**, Berletch, C.B., Disteche, C.M., Ecker, J.R., Mukamel, E.A. Brain-Specific DNA Methylation Signatures of Escape from X Chromosome Inactivation in the Mouse Frontal Cortex, Chicago, IL., October 2015.
- Shukla, D.K., Treiber, J., **Keown, C.L.**, Müller, R.-A. *Frontostriatal connections in the autism: A probabilistic diffusion tractography study*. Oral presentation at the 41<sup>st</sup> annual meeting of the Society for Neuroscience, Washington, D.C., November 11-15, 2011.
- Müller, R.-A., Shukla, D.K., Treiber, J., Nair, A., **Keown, C.L.**, Keehn, B., Tomasi, D. *Abnormal density of local functional connectivity in children and adolescents with Autism Spectrum Disorder*. Oral presentation at the 41<sup>st</sup> annual meeting of the Society for Neuroscience, Washington, D.C., November 11-15, 2011.
- **Keown, C.L.**, Shih, P., Keehn, B. & Müller, R.-A. *Investigation of functional systems with independent component analysis in Autism Spectrum Disorder*. Oral presentation at the 40th annual meeting of the Society for Neuroscience, San Diego, CA, 2010.

## CONFERENCE POSTERS

- Nair, A., **Keown, C. L.**, Datko, M., Khan, A. & R.-A. Müller. *Aberrant right temporo-thalamic connectivity in ASD: an fcMRI and graph theory study*. Abstract submitted for poster presentation at the 13<sup>th</sup> annual meeting of the International Meeting for Autism Research, San Sebastián, Spain, 2013.
- **Keown, C. L.**, Shih, P., Peterson, N., Nair, A., Datko, M. & R.-A Müller. *Aberrant short and long-distance functional connectivity MRI patterns in autism spectrum disorder*. Poster Presentation at the Inaugural Symposium of the San Diego Consortium for Developmental Cognitive Neuroscience, San Diego, CA, 2012.
- **Keown, C. L.**, Shih, P., Peterson, N., Nair, A., Datko, M. & R.-A Müller. *Atypical local and long-distance functional connectivity in autism spectrum disorder: An fcMRI study*. Poster presentation at the 42th annual meeting of the Society for Neuroscience, San Diego, CA, 2012.
- Abbott, A., Nair, A., **Keown, C. L.**, Datko, M & R.-A. Müller. *Neural correlates of repetitive behavior in autism spectrum disorders*. Poster presentation at the 42th annual meeting of the Society for Neuroscience, San Diego, CA, 2012.
- **Keown, C. L.**, Nair, A., Datko, M. C., Keehn, B., Shih, P., & R.-A. Müller. *Effects of methodological variables on resting state functional connectivity findings in autism spectrum disorders*. Poster presentation for the 2012 Third Biennial Conference on Resting State Brain Connectivity, Magdeburg, Germany, 2012.
- R.-A. Müller, Nair, A, Datko, M., Shih, P., **Keown, C. L.**, Maximo, J. & Fishman, I. *Is the resting state the royal road to intrinsic functional connectivity? The impact of methods on fcMRI results in autism*. Poster presentation for the Third Biennial Conference on Resting State Brain Connectivity, Magdeburg, Germany, 2102.

- Nair, A., **Keown, C.L.**, Datko, M., Keehn, B., Shih, P., & Müller, R.-A. *Comparison of methodological variables in functional connectivity MRI analyses of Autism Spectrum Disorders*. Poster presentation for the 2012 International Meeting for Autism Research, Toronto, Canada, 2012.
- Khan, A. J., Nair, A., **Keown, C.L.**, Keehn, B., & Mueller, R.-A. *Cerebro-Cerebellar Resting State Functional Connectivity for Motor and Prefrontal Networks in Adolescents with Autism Spectrum Disorders*. Poster presentation for the 2012 International Meeting for Autism Research, Toronto, Canada, 2012.
- Ghane, M., Nair, A., Keehn, B., **Keown, C.L.**, Townsend, J., Mueller, R.-A. *Attention Networks in Autism Spectrum Disorder: A Functional Connectivity MRI Study*. Poster presentation for the Cognitive Neuroscience (CNS) 19th Annual Meeting, Chicago, Illinois, 2012.

## **AWARDS**

- NIMH Predoctoral Fellowship, Institute for Neural Computation, July 2016.
- Department of Cognitive Science Teaching Award, 2015.
- Kavli Institute of Brain and Mind Fellowship, April 2014.

## **PROFESSIONAL MEMBERSHIPS**

- Society for Neuroscience (2010 – present)

## **WORK EXPERIENCE**

### **Developer & Analyst, Ozone Online, Online Marketing Agency, San Francisco (2003 – 2013)**

- Designed, built and managed web-based solutions for clients to manage their marketing database and marketing campaigns.
- Quantified and analyzed the performance of marketing campaigns in order to improve client's marketing strategy.
- Created and lead training seminars to train new employees and bridge the communication gap between the less-technical management team with the technically savvy development team.
- Managed development team through the process of website development.