

CURRICULUM VITAE

NAME: Benson Mwangi Irungu, Ph.D.

PRESENT TITLE: Assistant Professor
Department of Psychiatry & Behavioral Sciences
UTHealth

ADDRESS: 1941 East Road
Suite 3130
Houston, TX 77054

CITIZENSHIP: Kenyan

UNDERGRADUATE EDUCATION:

B.S., Computer Science, 2005
Kampala International University
Uganda

GRADUATE EDUCATION:

Ph.D., Neuroimaging, 2012
University of Dundee
UK

M.S., Computer Vision & Robotics, 2009
Heriot-watt University, UK
University of Girona, Spain
University of Burgundy, France

POSTGRADUATE TRAINING:

Postdoctoral Research Fellowship, 2012-2014
UT Center of Excellence on Mood Disorders
UTHealth Department of Psychiatry & Behavioral Sciences
Houston, TX

ACADEMIC APPOINTMENTS:

Assistant Professor, 2015 – Present

Instructor, 2014-2015
UTHealth Department of Psychiatry & Behavioral Sciences
Houston, TX

HONORS AND AWARDS:

2014 Society of Biological Psychiatry Chairman's Choice Award
 2010 Scottish Imaging Network Annual Scientific Meeting NEXXUS Best Oral Presentation
 2010 British Neuroinformatics Node Competitive Travel Award
 2009-2012 Scottish Imaging Network (SINAPSE) Scholarship to University of Dundee
 2007-2009 European Commission Erasmus Mundus Scholarship for Msc in Computer Vision and Robotics

EDITORIAL POSITIONS:

Peer reviewer, Frontiers in Neuroscience
 Peer reviewer, Human Brain Mapping
 Peer reviewer, Neuroradiology
 Peer reviewer, Biological Psychiatry
 Peer reviewer, Neuroinformatics Journal
 Peer reviewer, Journal of Affective Disorders
 Peer reviewer, Schizophrenia Bulletin
 Peer reviewer, Neuroimage
 Peer reviewer, Scientific Reports

PAST GRANT SUPPORT: (include project title, P.I., funding agency, award period and amount)

2012, Prediction of Treatment Response in Patients with Major Depressive Disorder using Magnetic Resonance Imaging, Anonymous trust University of Dundee. Approx. \$12,456 US. Role: Principal investigator

2014, Toward individualized outcome prediction of mild TBI using in vivo quantitative MRI, Role: Mission Connect.\$9,000. Co-Investigator.

2016, In vivo Neurite Imaging in Bipolar Disorders (INIB). UTHealth Psychiatry & Behavioral Sciences Seed Grant. \$16,000. Principal Investigator.

2016, A software tool to assist mental health care providers make personalized clinical decisions and improve patient outcomes. National Science Foundation (NSF). \$50,000 Principal Investigator.

Refereed Original Articles in Journals

1. Cao B, Passos IC, Wu MJ, Zunta-Soares GB, **Mwangi B**, Soares JC. (2017). Brain Gyrfication and Neuroprogression in Bipolar Disorder. Acta Psychiatr Scand. [Epub ahead of print]

2. Cao B, **Mwangi B**, Passos IC, Wu MJ, Keser Z, Zunta-Soares GB, Xu D, Hasan KM, Soares JC. (2017). Lifespan Gyrification Trajectories of Human Brain in Healthy Individuals and Patients with Major Psychiatric Disorders. *Sci Rep.* Mar 30;7(1):511
3. Cao B, Stanley JA, Passos IC, **Mwangi B**, Selvaraj S, Zunta-Soares GB, Soares JC. (2017). Elevated Choline-Containing Compound Levels in Rapid Cycling Bipolar Disorder. *Neuropsychopharmacology*. [Epub ahead of print]
4. Kramer LA, Hasan KM, Sargsyan AE, Marshall-Goebel K, Rittweger J, Donoviel D, Higashi S, **Mwangi B**, Gerlach DA, Bershad EM. (2017). Quantitative MRI volumetry, diffusivity, cerebrovascular flow and cranial hydrodynamics during head down tilt and hypercapnia: the SPACECOT study. *J Appl Physiol* [Epub ahead of print]
5. Cao B, Passos IC, **Mwangi B**, Amaral-Silva H, Tannous J, Wu MJ, Zunta-Soares GB, Soares JC. (2017). Hippocampal subfield volumes in mood disorders. *Mol Psychiatry*. [Epub ahead of print]
6. Pinto JV, Passos IC, Gomes F, Reckziegel R, Kapczinski F, **Mwangi B**, Kauer-Sant'Anna M. (2017). Peripheral biomarker signatures of bipolar disorder and schizophrenia: A machine learning approach. *Schizophr Res.* [Epub ahead of print].
7. Keser Z, Hasan KM, **Mwangi B**, E Gabr R, M Nelson F. (2017). Diffusion Tensor Imaging Defined Sulcal Enlargement Is Related to Cognitive Impairment in Multiple Sclerosis. *J Neuroimaging*. [Epub ahead of print].
8. Guadalupe T et al., (2017). Human Subcortical Brain Asymmetries in 15,847 People Worldwide Reveal Effects of Age and Sex. *Brain Imaging Behav.* [Epub ahead of print]
9. Kapczinski NS, **Mwangi B**, Cassidy RM, Librenza-Garcia D, Bermudez MB, Kauer-Sant'anna M, Kapczinski F, Passos IC, (2017). Neuroprogression and Illness Trajectories in Bipolar Disorder. *Expert Rev Neurother.* Mar;17(3):277-285.
10. Keser Z., Hasan KM., **Mwangi B.**, Gabr RE., Steinberg JL., Wilken J., Wolinsky JS., Nelson FM., (2016). Limbic Pathway Correlates of Cognitive Impairment in Multiple Sclerosis. *Journal of Neuroimaging*. [Epub ahead of print].

11. Cao B., Stanley JA., Selvaraj S., **Mwangi B.**, Passos IC., Zunta-Soares GB., Soares JC. (2016). Journal of Psychiatric Research. [Epub ahead of print].
12. Bauer IE., Wu MJ., Meyer TD., **Mwangi B.**, Ouyang A., Spiker D., Zunta-Soares GB., Huang H., Soares JC. (2016). The Role of White Matter in Personality Traits and Affective Processing in Bipolar Disorder. Journal of Psychiatric Research. [Epub ahead of print].
13. Bauer IE., Wu MJ., Frazier TW., **Mwangi B.**, Spiker D., Zunta-Soares GB., Soares JC. (2016). Neurocognitive Functioning in Individuals with Bipolar Disorder and their Healthy Siblings: A preliminary study. Journal of Affective Disorders. [Epub ahead of print].
14. Schmaal L., Hibar DP., Samann PG., Hall GB. Et al. (2016). Cortical Abnormalities in Adults and Adolescents with Major Depression Based on Brain Scans from 20 Cohorts Worldwide in the ENIGMA Major Depressive Disorder Working Group. Molecular Psychiatry. [Epub ahead of print].
15. Passos IC., **Mwangi B.**, Vieta E., Berk M., Kapczinski F. (2016). Areas of Controversy in Neuroprogression in Bipolar Disorder. Acta Psychiatrica Scand. 134. 91-103.
16. **Mwangi B.**, Wu MJ., Cao B., Passos IC., Lavagnino L., Keser Z., Zunta-Soares GB., Hasan KM., Kapczinski F., Soares JC. (2016). Individualized Prediction and Clinical Staging of Bipolar Disorders using Neuroanatomical Biomarkers. Biological Psychiatry Cognitive Neuroscience & Neuroimaging. 1. 186-194.
17. Cao B., Bauer IE., Sharma AN., **Mwangi B.**, Frazier T., Lavagnino L., Zunta-Soares GB., Walss-Bass C., Glahn DC., Kapczinski F., Nielsen DA., Soares JC. (2016). Journal of Affective Disorders. [Epub ahead of print].
18. Lavagnino L., **Mwangi B.**, Bauer IE., Cao B., Selvaraj S., Prossin A., Soares JC. (2016). Reduced Inhibitory Control Mediates the Relationship Between Cortical Thickness in the Right Superior Frontal Gyrus and Body Mass Index. Neuropsychopharmacology. [Epub ahead of print].
19. Wu MJ., **Mwangi B.**, Bauer IE., Passos IC., Sanches M., Zunta-Soares GB., Meyer TD., Hasan KM., Soares JC. (2016). Neuroimage. [Epub ahead of print]

20. Lavagnino L., Aminato F., **Mwangi B.**, D'Agata F., Spalatro A., Zunta-Soares GB., Daga GA., Mortara P., Fassino S., Soares JC. (2016). Psychiatry Research: Neuroimaging. 248. 105-109.
21. Passos IC., **Mwangi B.**, Cao B., Hamilton JE., Wu MJ., Zhang XY., Zunta-Soares GB., Quevedo J., Kauer-Sant'Anna M., Kapczinski F., Soares JC. (2016) Journal of Affective Disorders. 193. 109-116.
22. Hibar DP., Westlye LT., van Erp TG., Rasmussen J., Subcortical Volumetric Abnormalities in Bipolar Disorder. Molecular Psychiatry. [Epub ahead of print]
23. Passos IC., **Mwangi B.**, Kapczinski F. (2016) Big Data Analytics and Machine Learning: 2015 and Beyond. Lancet Psychiatry. 3. 13-15.
24. Wu M., Passos IC, Bauer IE, Lavagnino L., Cao B., Zunta-Soares GB., Kapczinski F., **Mwangi B.**, Soares JC. (2016). Individualized Identification of Euthymic Bipolar Disorder using the Cambridge Neuropsychological Test Automated Battery (CANTAB) and Machine Learning. Journal of Affective Disorders. 192. 219-225.
25. Cao B., Passos IC., **Mwangi B.**, Bauer IE., Zunta-Soares GB., Kapczinski, F., Soares JC. (2016). Hippocampal Volume and Verbal Memory Performance in Late-stage Bipolar Disorder. Journal of Psychiatric Research. 73.102-107.
26. Sandoval H., Soares JC., **Mwangi B.**, Asonye S., Alvarado LA., Zavala J., Ramirez ME., Sanches M., Enge LR., Escamilla MA. (2016.). Confirmation of MRI Anatomical Measurements as Endophenotypic Markers for Bipolar Disorders in a New Sample from the NIMH Genetics of Bipolar Disorder in Latino Populations Study. Psychiatric Research. 247. 34-41
27. **Mwangi B.**, Wu MJ., Bauer IE., Modi H., Zeni CP., Zunta-Soares GB., Hasan KM., Soares JC. (2015) Predictive Classification of Predictive Bipolar Disorder using Atlas-based Diffusion Weighted Imaging and Support Vector Machines. Psychiatry Research. 234. 265-271.
28. Zeni CP., **Mwangi B.**, Cao B., Hasan KM., Walss-Bass C., Zunta-Soares GB., Soares JC. (2016). Interaction between BDNF rs6265 Met Allele and Low Family Cohesion is Associated with Smaller Left Hippocampal Volume in Pediatric Bipolar Disorder. J of Affective Disorders 189. 94-97.

- 29.
30. Hasan, KM., **Mwangi, B.**, Cao B., Keser, Z., Tustison, NJ., Kochunov, P., Frye, RE., Savatic, M., Soares JC. (2015) Entorhinal Cortex Thickness across the Human Lifespan. *Journal of Neuroimaging* 26:278-82
31. Keser, Z., Hasan, HM., **Mwangi B.**, Kamali, A., Ucisik-Keser, FE., Riascos, RF., Nuray Yozbatiran, N., Francisco, GE., Narayana PA., (2015) Diffusion tensor imaging of the human cerebellar pathways and their interplay with cerebral macrostructure. *Frontiers in Neuroanatomy*
32. Wu M-J., Wu, HE., **Mwangi, B.**, Sanches, M., Selvaraj, S., Zunta-Soares, GB., Soares, JC. (2015) Prediction of pediatric unipolar depression using multiple neuromorphometric measurements: A pattern classification approach. *J of Psychiatric Research*. 62. 84-91.
33. Lavagnino, L., Amianto, F., **Mwangi, B.**, D'Agata, F., Spalatro, A., Zunta-Soares, GB., Daga, GA., Mortara, P., Fassino, S., Soares, JC. (2015) Identifying neuroanatomical signatures of anorexia nervosa: a multivariate machine learning approach. *Psychological Medicine*. 45:2805-2812.
34. Bauer, IE., Ouyang, A., **Mwangi, B.**, Sanches, M., Zunta-Soares, GB., Keefe, RSE., Huang, H., Soares JC. (2015) Reduced white matter integrity and verbal fluency impairment in young adults with bipolar disorder: A diffusion tensor imaging study. *J of psychiatric research*. 62. 115-162.
35. Lavagnino, L., Cao, B., **Mwangi, B.**, Wu, M-J., Sanches, M., Zunta-Soares, GB., Kapczynski, F., Soares, JC. (2015) Changes in the corpus callosum in women with late-stage bipolar disorder. *Acta Psychiatrica Scandinavica*. 131: 458-464.
36. Cao, B., **Mwangi, B.**, Hasan, K.M., Selvaraj, S., Zeni, CP., Zunta-Soares, GB., Soares, JC (2015) Development and validation of a brain maturation index using longitudinal neuroanatomical scans. *Neuroimage* 117:311-318.
37. **Mwangi, B.**, Soares, J.C., Khader M. Hasan.,(2014) Visualization and unsupervised predictive clustering of high-dimensional multimodal neuroimaging data. *Journal of Neuroscience Methods* (Epub ahead of print).
38. Johnston, B.A., **Mwangi, B.**, Matthews, K., Coghill, D., Konrad, K., Steele, J.D. (2014) Brainstem Abnormalities in ADHD Support High Accuracy Individual Diagnostic Classification. *Human Brain Mapping* (Epub ahead of print).

39. Galvez, JF., Bauer, IE., Sanches, M., Wu, EH., Hamilton, JE., **Mwangi B.**, Kapczynski, F.P., Zunta-Soares, GB., Soares J.C. (2014) Shared clinical Associations between obesity and impulsivity in rapid cycling bipolar disorder: A systematic review. *Journal of affective disorders* (Epub ahead of print).
40. **Mwangi, B.**, Spiker, D., Zunta-Soares, G.B., Soares, J.C. (2014) Prediction of pediatric Bipolar disorder using neuroanatomical signatures of the amygdala. *Bipolar Disorders* (Epub ahead of print).
41. Thompson, P.M. et al (2014). The ENIGMA consortium: large-scale collaborative analyses of neuroimaging and genetic data. *Brain Imaging and Behavior*.8(2) : 153- 82.
42. **Mwangi, B.**, Tian, T.S., Soares, J.C. (2014). A Review of Feature Reduction Techniques in Neuroimaging. *Neuroinformatics*. 12(2) : 229-244.
43. **Mwangi, B.**, Hasan, KM., Soares, JC. (2013). Prediction of Individual Subjects Age across the Human Lifespan Using Diffusion Tensor Imaging: A Machine Learning Approach. *Neuroimage* 75 : 58-67.
44. Johnston, B.A., **Mwangi, B.**, Matthews, K., Coghill, D., Steele, JD. (2012). Predictive Classification of Individual Magnetic Scans from Children and Adolescents. *European Journal of Child & Adolescent Psychiatry* 22: 733- 744.
45. **Mwangi, B.**, Ebmeier, K.P., Matthews, K., Steele, JD.(2012). Multicentre Diagnostic Classification of Individual Structural Neuroimaging Scans from Patients with Major Depressive Disorder. *Brain* 135:1508-1521.
46. **Mwangi, B.**, Matthews, K., Steele, JD. (2011). Prediction of Illness Severity in Patients with Major Depression using Structural Magnetic Resonance Imaging Scans. *Journal of Magnetic Resonance Imaging* 35:64-71.
47. Sprengelmeyer, R., Steele, J.D., **Mwangi, B.**, Kumar, P., Christmas, D., Milders, M., Matthews, K. (2011). The Insular Cortex and the Neuroanatomy of Major Depression. *Journal of Affective Disorders* 133:120-127.

Other Professional Communications

Presentations

- Mwangi, B., Leveraging on big-data analytics in elucidating the pathophysiology of neuropsychiatric disorders. October 8 2013. The

University of Texas Health Science Center at Houston Annual Research symposium

- Mwangi, B., Matthews, K., Steele, JD. (2010). Computer Aided Diagnosis of depressive illness: A Hybrid Model Combining Voxel-Based Morphometry, Feature Based Morphometry and Support Vector Machine. Scottish Imaging Network (SINAPSE) Annual Scientific Conference, Edinburgh, UK. **warded NEXXUS best oral presentation.**
- **Mwangi, B.**, Matthews, K., Steele, J.D. (2010). Estimation of Statistical Power in a Multicentre MRI Study. Poster presentation at Institute of Physical Sciences in Medicine Conference, Edinburgh UK, March 2010.

Scientific Exhibits

- Mwangi, B., Wu, H., Bauer, I., Zunta-Soares, G.B., Soares, J.C. (2014). Distinguishing individual subjects with bipolar or unipolar depression using structural neuroimaging scans. Society of biological psychiatry annual conference, May 8-12 2014, New York, USA.
- Wu, M.J. Wu H., Mwangi, B., Sanches, M., Selvaraj, S., Zunta-Soares, G.B., Soares, J.C. (2014). Prediction of pediatric unipolar depression and characterization of maturation trajectories using multiple neuromorphometric measurements. Society of biological psychiatry annual conference, May 8-12 2014, New York, USA.
- Mwangi, B., Hasan K.M., Soares J.C. (2013). Unsupervised identification of population patterns in high-dimensional multimodal neuroimaging scans: A data-driven machine learning approach. American College of Neuropsychopharmacology Conference, December 8-12 2013, Hollywood, Florida, USA.
- Mwangi, B., Soares, J.C., Hasan, K.M. (2013). Decoding and evaluation of cerebral maturation and aging patterns using Diffusion Tensor Imaging. Poster presentation at the 2013 Organization of Human Brain Mapping Conference, June 16-20 2013, Seattle, Washington, USA.
- Mwangi, B., Soares, J.C., Hasan, K.M. (2013). Decoding Healthy Maturation and Aging Patterns across Lifespan using Diffusion Tensor Imaging. Poster presentation at the 2013 Society of Biological Psychiatry Conference, May 16-18, San Francisco, USA. **Abstract was ranked amongst top 51 out of over 800 abstracts based on overall reviewer scores.**
- Mwangi, B., Hunt, S.C., Spiker D., Zunta-Soares, G.B., Soares, J.C. (2013). Predictive Classification of Pediatric Bipolar Disorder using Amygdala Morphometric Features. Poster presentation at the 2013 Society of Biological Psychiatry Conference, May 16-18, San Francisco, USA.
- Johnston, B.A., Gradin, V.B., Mwangi, B., Stirling, M., Walker, K., MacFarlane, J., Matthews, K., Steele, J.D. (2012). Using Structural and Functional MRI to Predict Diagnostic Status and Symptom Severity in Major Depression. December 14 2012, Scottish Mental Health Network. Annual Scientific Meeting, . **Poster awarded best poster award.**

- Mwangi, B., Matthews, K., Steele, JD. (2011). Prediction of clinical scores from structural brain scans in Major Depressive Disorder. June 2011, Scottish Imaging Network (SINAPSE) Annual Scientific Conference, Dundee, UK.
- Mwangi, B., Matthews, K., Steele, J.D.(2011) "Prediction of Illness Severity Rating Scores from Structural Brain Scans in Major Depressive Disorder. Poster presentation at Neuroinformatics 2011 conference, Sept 4-6, 2011, Boston USA. **Travel competitively sponsored by the British Neuroinformatics Node.**