

# Brain Imaging and Computation for Precision Mental Health

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Fall 2023



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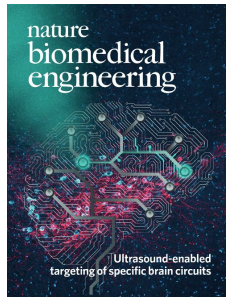
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# Biography



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IEEE Senior Member  
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- 2017-2020, Postdoc, Stanford University
- 2016-2017, Postdoc, UNC Chapel Hill
- 2013-2016, Assistant Professor, ECUST
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**Data-driven EEG analysis for psychiatric subtyping (2020)**  
Yu Zhang, Wei Wu, Amit Etkin



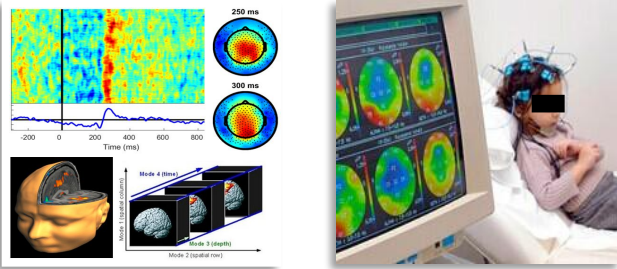
**EEG latent mapping for antidepressant outcome prediction (2020)**  
Wei Wu, Yu Zhang, Amit Etkin



**Functional MRI regulation differentiates antidepressant response (2019)**  
Gregory Fonzo, Amit Etkin, Yu Zhang

# From Neural Circuits to Biomarkers for Precision Mental Health

## Brain Disease Diagnosis & Treatment



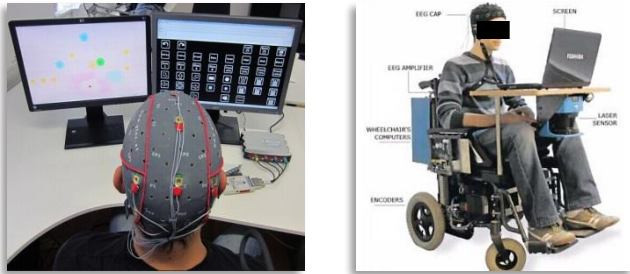
## What physiology and pathology to be studied?

- Mental disorders caused by brain dysfunctions
- Biomarkers associated with psychopathology underlying the disorders
- Mechanism of neural circuits for neurobiological phenotype

## Why is this topic significant?

- Affect a large population but mechanism/pathology is underexplored.
- One-size-fits-all treatment limits clinical outcome
- Lack of powerful computational tools to reveal intrinsic neural circuits for biomarker identification
- Cutting-edge AI techniques bring new opportunities

## Brain-Machine Interaction



## How is this topic studied?

- Advanced neuroimaging techniques, including EEG and fMRI, etc.
- Machine learning/Deep learning
- Brain-computer interaction system design

## What are the future directions of this research?

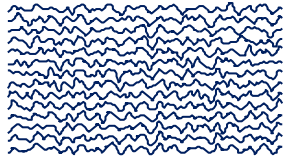
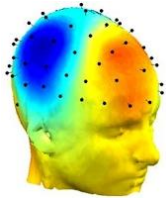
- Quantification of neural biomarkers for early diagnosis of brain diseases
- Data-driven subtype identification and clinical outcome prediction
- Advanced brain-computer interaction and intelligent medicine using AI techniques

**Keywords:** Brain imaging, machine learning, computational neuroscience, neural biomarker, precision mental health

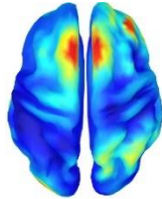
# Research Approach

## Neuroimaging Techniques

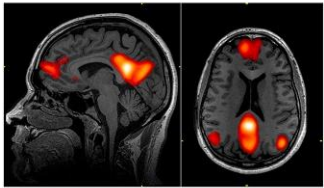
EEG



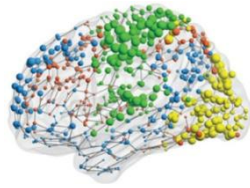
Source signals



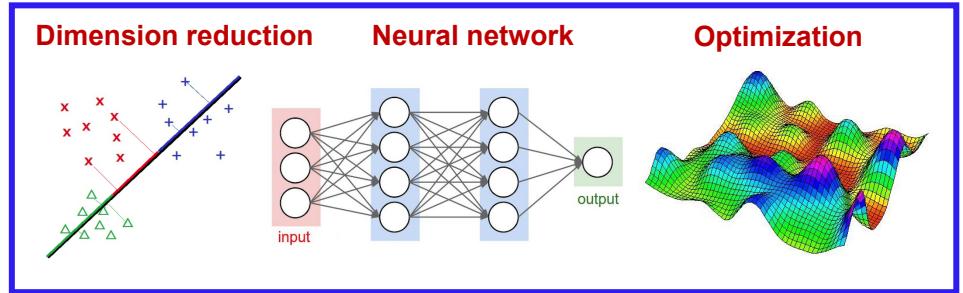
fMRI



Connectivity

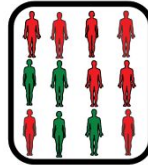


## Cutting-edge AI Techniques Machine Learning & Deep Learning

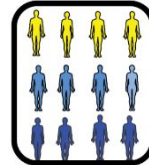


## Personalized Medicine

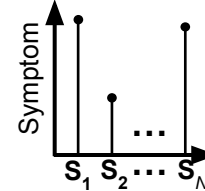
Diagnosis



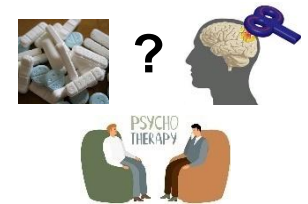
Subtyping



Prediction



Treatment optimization



# Contact

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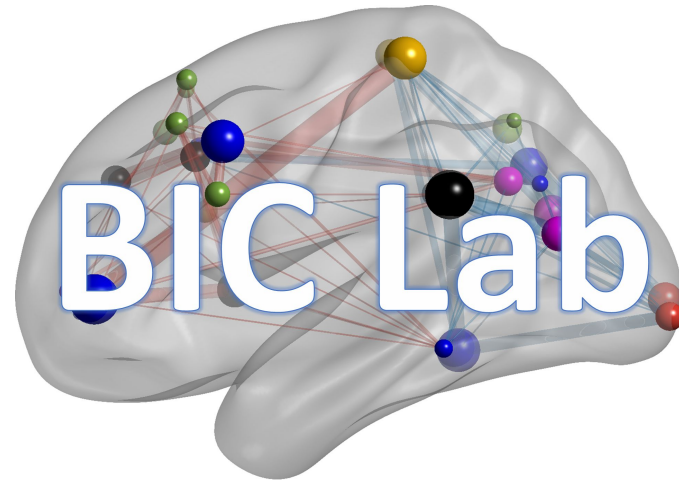
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