About Me



NAME

Wael Korani, Ph.D.

TITLE

Assistant Professor of Data Science

Director, MIND Lab

YEARS AT UNT

Since late 2022

RESEARCH FOCUS AREAS

- Electroencephalography (EEG) biomarkers for depression therapy outcome
- An objective ADHD severity score from EEG
- Alzheimer's and frontotemporal dementia classification from EEG
- Seizure prediction from EEG
- Explainable, leakage-free deep learning for clinical EEG
- Nature-inspired optimization (Mother Tree Optimization)

Depression: 470 Adults Across Four Cohorts

470

adults with major depression and pretreatment EEG

Four cohorts in the NIH R21 resubmission

CAN-BIND-1 · Canada

138

patients on escitalopram, a selective serotonin reuptake inhibitor (SSRI)

Data agreement executed August 2026

TDBRAIN · public dataset

121

patients treated with repetitive transcranial magnetic stimulation (rTMS)

78 responders, 43 non-responders

Existing rTMS cohort

61

patients treated with rTMS

Pretreatment EEG with response labels

Center for Integrative Psychiatry

150

to enroll: 110 SSRI, 40 rTMS

Coppell, TX · IRB approved · 21-channel EEG

One pipeline for every cohort: 19 shared channels, one cleaning pipeline, and site differences removed before any model is trained.

Depression: Choosing the Right Treatment Sooner

NIH R21 resubmission due February 16, 2027 · Collaborator: Dr. Tahir Khwaja

The problem today

- Major depressive disorder affects about 21 million US adults a year and costs over $210 billion
- About 50% respond to the first treatment
- About 30% reach remission on the first treatment
- No objective test guides the choice of therapy, so doctors rely on trial and error

Our goal

An objective EEG-based decision support system that identifies, before a therapy begins, patients unlikely to respond to it, so psychiatrists can change course weeks earlier

Resting EEG
before therapy

→

Predicted response
to SSRI or rTMS

→

Change course
weeks earlier

ADHD as a Spectrum: A Severity Score from EEG

NIH R03 submitted October 2026 · Sole PI

The problem today

- About seven million US children aged 3 to 17 have a current ADHD diagnosis
- Diagnosis relies entirely on behavioral rating scales, with no objective biological test
- Doctors need a severity spectrum, not a binary label

Our goal

An objective EEG-based system that helps clinicians diagnose ADHD, characterize severity, and predict treatment response

Each child placed on a severity spectrum



Typical — Severe

Alzheimer's and Frontotemporal Dementia from EEG

With Salleh Sonko and Dr. Gahangir Hossain · Next: NIH R21 planned for 2027

The problem today

- Dementia causes memory loss and other symptoms
- Telling Alzheimer's disease (AD) and frontotemporal dementia (FTD) apart, and from cognitively normal people, is a major clinical challenge
- Their EEG signs overlap

Our goal

An EEG-based tool that helps clinicians detect AD and tell it apart from FTD

Resting EEG
recording

→

AD, FTD, or
cognitively normal

→

Clearer diagnosis
for clinicians

2026 papers: Brazilian Journal of Physics · ACM ICONS · IEEE IRI · ICONIP, Melbourne

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