

## **Ching-yi Wu**

### **Lab**

Motor and Behavioral Analysis Lab (MBA Lab)

### **Research highlight:**

Professor Wu's research areas are on neurorehabilitation for motor and cognitive recovery and healthy promotion for the elderly. The main focus is to develop novel approaches for rehabilitating motor impairment and cognitive dysfunction in persons with stroke, traumatic brain injury, and elders with mild cognitive impairments and mild dementia. Professor Wu also conducts health promotion programs to enhance active aging for the community-based elders. Multi-component or multi-factor approaches involving electrophysiological techniques are emphasized such as combining tDCS with mirror therapy, robotic with computer game, robotic with Botox injection, robotic with mirror therapy, exercise with cognitive training, etc. Mechanisms underlying these approaches are also addressed in terms of neuroimage (fMRI, MEG), electrophysiology (EEG), biomechanical analysis (kinematic and EMG), and computer learning techniques.

### **People:**

Ching-yi Wu      PI  
Cheng-yu Li      Graduate Student  
Yu-Shian Liao    Graduate Student  
Ru-Hsuan Chan    Graduate Student

### **Contact:**

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MBA Lab          <http://cguotlab.org/intro>

## **Kuan-yi Li**

### **Lab:**

Sensorimotor control laboratory

### **Research highlight:**

Professor Kuan-yi Li mainly investigate perception and motor control for individuals with neurodegenerative disease. Specifically, several studies have been done to quantify the kinesthetic deficits for individuals Parkinson's disease in the past years. Another research focus is to exam the effect of current clinical interventions and develop treatment protocols for individuals with Parkinson's disease, Alzheimer's disease and stroke.

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**Pei-Ying S Chan****Lab:**

Respiratory Sensation & Psychophysiology Lab

**Research highlight:**

My research interests include cerebral mechanisms of respiratory sensation, emotional effects on respiratory interoceptive awareness, central neural gating of respiratory sensation, and rehabilitation outcomes in clients with mental health issues.

**People:**

Yu-Ting Wu	Research Assistant
Ting-Yin Kuo	Graduate Student
Szu-Min Lai	Office Support Personnel

**Contact:**

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**Yu-Wei Hsieh****Lab:**

Clinical Neurorehabilitation Research Lab

**Research highlight:**

Dr. Hsieh's lab focuses on investigating the effects of novel neurorehabilitation approaches on improving arm and hand function and daily performance in patients with stroke, including action observation treatment, mirror therapy, and motor imagery combined with action observation. Our lab also explores the neural mechanisms of stroke neurorehabilitation approaches by using brain image technique such as Magnetoencephalography (MEG).

**People:**

Yu-Wei Hsieh	PI
Jun-Ding Zhu	Research Assistant
Tze-Hsuan Peng	Research Assistant

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## **Hsiang-Han Huang**

### **Lab:**

Infant and Toddler Perceptual-Motor Behavior Lab

### **Research highlights:**

On the basis of perception-action framework and dynamic systems theory, Dr. Huang's research applies motor behavior analysis and focuses on examining the relationship between environments and action patterns in infants/children with neurological deficits or motor disabilities. Current projects include the study of independent mobility and psychosocial function in infants/toddlers, the study of applying low-tech assistive device on body structure, activity and participation levels in young children with motor disabilities, and the study of environmental stimulation on perceptual-motor development in preterm and term infants.

### **People:**

Wan-Ying, Tsai	Research Assistant
Ching-Hao, Chang	Graduate Student
Ai-Tzu, Chan	Graduate Student
Yu-Wen, Chu	Graduate Student

### **Contact:**

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## **Poyu Chen**

### **Lab**

Aging, Brain, and Cognition Lab (ABC Lab)

### **Research highlight:**

Our general research goal is to understand the brain mechanisms underlying human behaviors, especially the cognitive-affective neuroscience and neurorehabilitation. Our work combines behavioral measurements, electroencephalography (EEG), and neurofeedback. We take bench-to-bedside approach—we investigate both healthy and clinical populations.

### **People:**

Poyu Chen	Principle Investigator
Hsin-Hao Liu	Research Assistant, MSc
Mei-Ju, Chi	Research Assistant, BA

### **Graduate Student**

Jia-Hui, Lin

### **Undergraduate students**

Fu-Yun, Lee Bachelor's student in occupational therapy

Zu-Ai, Lu Bachelor's student in occupational therapy

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### **Chia-Hsiung Cheng**

### **Lab**

Laboratory of Brain Imaging and Neural Dynamics (BIND Lab)

### **Research highlight:**

Laboratory of Brain Imaging and Neural Dynamics (BIND Lab) primarily aims at investigating brain functions by using behavioral tasks and non-invasive brain imaging modalities, e.g., magnetoencephalography (MEG), electroencephalography (EEG), magnetic resonance imaging (MRI), combined with the state-of-the-art signal analysis methods. The current goal of our lab is to use electrophysiological signals to elucidate the effects of normal and pathological aging (e.g., mild cognitive impairment, Alzheimer's disease) on the perception, memory, and inhibitory function. Recently, we also study neurological and psychiatry-related disorders, and attempt to identify the neuroimaging markers that likely serve as prognosis and/or follow-up indicators of these diseases as well as the rehabilitation benefits from therapeutic intervention.

### **People:**

Chia-Hsiung Cheng	PI
Hsinjie Lu	Research Assistant
Wei-Tung Lin	Research Assistant
Hua-Hsuan Sun	Graduate Student

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BIND Lab <https://sites.google.com/site/chiahsiungcheng/>

## **I-ching Chuang**

### **Lab:**

community-based health aging laboratory

### **Research highlight:**

Our lab mainly focuses on studies related to healthy aging program and treatment protocols for older adults with cognitive impairment. In order to improve daily functions and participation in older adults with evidence-based practice, we have investigated or compared the efficacy of different innovative treatments such as sequential training and dual-task training. Another research focus is to develop and validate the measurements applied in clinical practice.

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## **I-Hsuan Shen**

### **Lab**

Electrophysiological Lab

### **Research highlight:**

Dr. Shen's research interest focuses on investigating neural mechanisms of cognitive processes. In our lab, we use a variety of different behavioral measures and event-related brain potential to study children's executive functions including inhibition, switching, and working memory. Current projects include working memory in children with ADHD, the relationship between mathematics anxiety, working memory, and mathematics in children; the time course of reading processes in children with dyslexia.

### **People:**

I-Hsuan Shen    PI  
Yuan-Ru Chen    Research Assistant  
Chin-Yi Huang    Graduate Student  
Ying-Shin Lin    Graduate Student

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## **Hsin-Yung Chen**

**Lab**

Neuroengineering and Assistive Technology Lab

**Research highlights:**

The mission and interest of the Neuroengineering and Assistive Technology Lab are to develop technologies or devices, based on behavioral and neuroscience perspectives, to understand the neural regulation of the adaptive behavior to translate the work into practical research and clinical applications. The current research topics involve (a) Therapeutic effect of transcranial electrical stimulation in CNS plasticity; (b) Alternation of executive functioning induced in early life social defeat (e.g., the bullying experiences); and (c) Design and application of biofeedback technique in the assistive device.

**People:**

Hsin-Yung Chen    PI  
Ho-Hsuan Lee     Research Assistant

**Contact:**

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**Ling-Fu Meng****Lab**

Neurocognition, Orthographic Processing & Accessibility Lab

**Research highlights:**

This lab studies the issue of the output of cognitive mechanism as well as that of accessibility, particularly focusing on writing/dysgraphia, gesturing/dyspraxia, handedness and computer access in persons with developmental and acquired difficulties. We usually design the neurocognitive tasks/questionnaires and select the compatible behavioral instruments to address the cognitive mechanisms as well as the behavioral characteristics. Functional MRI and EEG/ERP are also used by us for the purpose of investigating the brain mechanism of writing, praxis and handedness. Furthermore, to integrate mechanisms, assessments and interventions in each of the aforementioned specific topic is our research goal.

**People:**

Meng-Fu Meng    PI  
Ching-I Wang     Research Assistant

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