廖婉彣

高齡健康照護系 助理教授

連絡資訊

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學歷

- 博士：美國馬里蘭大學復健科學研究所
  Physical Rehabilitation Science, University of Maryland Baltimore, Maryland, USA
- 碩士：國立臺灣大學職能治療學研究所
- 學士：國立成功大學職能治療學系

現職及經歷

- 國立臺北護理健康大學 高齡健康照護系 專案助理教授
- 國立臺北護理健康大學 高齡健康照護系 兼任助理教授
- 沐晨職能治療所 職能治療師
- 長庚大學職能治療學系 博士後研究員
- 高雄長庚醫院 博士後研究員
- 國立臺灣大學職能治療學系 博士後研究員

學術專長及研究

- 中風神經復健
- 高齡者日常生活復能
- 高齡者神經及認知功能復健
- 腦神經調控技術 (穿顱磁刺激及經顱直流電刺激)
- 大數據分析
- 創新醫療科技應用 (虛擬實境及醫療機器人)

證照

- 職能治療師

獲獎紀錄

- 2021 臺灣職能治療學會 優秀研究論文獎
- 2017 美國馬里蘭大學 優秀研究論文獎
- 2015-2016 美國馬里蘭大學 論文發表補助
- 2010 臺灣職能治療學會 最佳口頭報告獎

SCI/SSCI 期刊審查

- Frontiers in Rehabilitation Science 客座編輯 Research topic: Motor Learning in Older Adults and Patient Populations.
- Neurorehabilitation and Neural repair
- Clinical Rehabilitation
- Disability and Rehabilitation
- Plos One
- OTJR: Occupation, Participation, and Health

研究計畫

- 110-2 國立臺北護理健康大學 新進教師及研究員提升研究能量計畫。計畫名稱：運用機器學習建立腦中風患者接受神經復健後之精準預測模型。

著作目錄

期刊論文

- **Liao, W.W.**, Hsieh, Y.W., Lee, T.H. & Wu, C.Y. (2022). Machine learning predicts clinically significant health related quality of life improvement after sensorimotor rehabilitation interventions in chronic stroke. *Scientific Reports. 12,* 11235. **(SCI, IF= 4.996, Rank=19/73, Multidisciplinary Science)**
- Chuang, I.C., **Liao, W.W.,** Wu, C.Y., Yeh, T.T., Chen, C.L., Lin, C.H., Huang, T.H., Pei, Y.C (2022). Baseline Global Cognitive Function Impacts Cognitive and Functional Outcomes of Combined Physical and Cognitive Training in Older Adults with Cognitive Decline. *American journal of occupational therapy, 76.* **(SSCI, IF= 3.776, Rank=33/74, Q2, Rehabilitation)**
- Chen, Y.W., **Liao, W.W.,** Chen, C.L., & Wu, C.Y. (2021). Kinematic descriptions of upper limb function using simulated tasks in activities of daily living after stroke. *Human Movement Science,* 79, 102834. **(SCI, IF=2.161, Rank= 54/77, Q3, Physiology)**
- Thakkar, H. K., **Liao, W.W.,** Wu, C.Y., Hsieh, Y.W., & Lee, T.H. (2020). Predicting clinically significant motor function improvement after contemporary task-oriented interventions using machine learning approaches. *Journal of NeuroEngineering and Rehabilitation,* 17, 131. **Co-first authors. (SCI, IF=5.218, Rank=4/68, Q1, Rehabilitation)**
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- Li, Y. C, **Liao, W. W.,** Hsieh, Y. W., Lin, K. C., & Chen, C. L. (2019). Predictors of Clinically Important Changes in Actual and Perceived Functional Arm Use of the Affected Upper Limb After Rehabilitative Therapy in Chronic Stroke. *Archives of physical medicine and rehabilitation,* 101, 442-449. **(SCI, IF= 4.489, Rank=5/68, Q1, Rehabilitation)**

- **Liao, W. W.,** Whitall, J., Wittenberg, G. F., Barton, J. E.,& McCombe Waller, S. (2019). Not all brain regions are created equal for improving bimanual coordination in individuals with chronic stroke. *Clinical Neurophysiology*, 130, 1218-1230. (**SCI, IF= 4.574, Rank=81/208, Q2, Clinical Neurology)**
- **Liao, W. W,** Whitall, J., Barton, J. E.,& McCombe Waller, S. (2018). Neural motor control differs between bimanual common-goal vs. bimanual dual-goal tasks. *Experimental Brain Research, 236*, 1789-1800. **(SCI, IF= 2.166, Rank=238/293, Q4, Neurosciences)**
- **Liao, W. W.,** McCombe Waller, S., & Whitall, J. (2018). Kinect-based Individualized Upper Extremity Rehabilitation is Effective and Feasible for Individuals with Stroke Using a Transition from Clinic to Home Protocol. *Cogent Medicine*, 5, 1428038. https://doi: 10.1080/2331205x.2018.1428038.
- Kantak, S. S., Wittenberg, G. F., **Liao, W. W**., Magder, L. S., Rogers, M. W., & McCombe Waller, S. (2013). Posture-related Modulations in Motor Cortical Excitability of the Proximal and Distal Arm Muscles. *Neuroscience letters*, 533, 65-70. https://doi: 10.1016/j.neulet.2012.10.048 **(SCI, IF= 2.855, Rank=194/293, Q3, Neurosciences)**
- **Liao, W. W.**, Wu, C. Y., Hsieh, Y. W.. Lin, K. C., & Chang, W. Y. (2012). Effects of Robot-assisted Upper Limb Rehabilitation on Daily Function and Real-world Arm Activity in Patients with Chronic Stroke: A Randomized Controlled Trial. *Clinical rehabilitation*, 26, 111-120. https://doi: 10.1177/0269215511416383 **(SCI, IF=4.193, Rank=10/68, Q1, Rehabilitation)**
- Hsieh, Y. W., Wu, C. Y., **Liao, W. W.**, Lin, K. C., Wu, K. Y., & Lee, C. Y. (2011). Effects of Treatment Intensity in Upper Limb Robot-assisted Therapy for Chronic Stroke: A Pilot Randomized Controlled Trial. *Neurorehabilitation and neural repair*, 25, 503-511. https://doi: 10.1177/1545968310394871 **(SCI, IF=5.378, Rank=6/68, Q1, Rehabilitation)**
- **Liao, W. W.**, Lin, K. H., Hsieh, Y.W., Chuang, L. L., Wu, C. Y., & Lin., K.C. (2010). Effects of Robot-Assisted Therapy in Stroke Rehabilitation: A Systematic Review of Randomized Controlled Trials. *Formosan Journal of Physical Therapy*, 35, 126-138.

研討會論文

- Lin, CY, Liu, CT, Lin SH, **Liao WW,** & Wu CY. Effects and change progressions of transcranial direct current stimulation (tDCS) at premotor cortex versus primary motor cortex with mirror therapy following stroke: A pilot RCT

(Dec 2021). European Congress of NeuroRehabilitation 2021 jointly with 27th Annual Meeting of the German Society of NeuroRehabilitation. (Virtual conference).

- Thakkar, H. K., **Liao, W.W.**, Wu, C.Y., Hsieh, Y.W., & Lee, T.H. (Nov 2021). Predicting clinically significant motor function improvement after contemporary task-oriented interventions using machine learning approaches. Taiwan Occupational Therapy Association Conference, Taipei, Taiwan. **Co-first author**

  Best Research Paper Award Presentation

- Wu, CY, Chuang, IC, & **Liao, WW.** The Application of Virtual Reality in Cognitive Training with the Daily Life Context: Gardening Coach (Dec 2020). The 5th NTU – KU Joint Symposium 2020 AI & Smart Medicine for Digital Health (Virtual conference).
- Wu, CY, **Liao, WW** & Chuang, IC. Domain-specific Improvements of Combined Physical Activity and Cognitive Intervention on Cognitive and Instrumental Activities of Daily Living Function in Older Adults with Mild vs. Moderate-to-severe Cognitive Impairments (Dec 2020). Alzheimer's Disease International (ADI) International Conference 2020, Singapore (Virtual conference).
- **Liao WW,** Chuang IC, & Wu, CY. Differential Effects of Combined Physical Activity and Cognitive Training on Cognition and Activities of Daily Living in Individuals with Mild vs. Moderate-to-Severe Cognitive Decline (Oct 2019). 11th International Association of Gerontology and Geriatrics Asia/Oceania Regional Congress, Taipei, Taiwan.
- **Liao WW,** Whitall J, Barton J, & Waller SM. Individualizing Non-invasive Brain Stimulation to Improve Bimanual Coordination in Individuals with Chronic Stroke (Jun 2019). International Society of Physical and Rehabilitation Medicine Annual Conference, Kobe, Japan.
- **Liao WW**, Whitall J, Barton J, & Waller SM. Neural Control Mechanisms differ between bimanual common- vs. dual-goal tasks (Feb 2018). APTA Combined Section Meeting Conference, New Orleans, LA. USA
- **Liao WW**, Whitall J, Barton J, & Waller SM. Tailoring non-invasive brain stimulation to enhance bilateral arm coordination in individuals with chronic stroke (Nov 2017). Society for Neuroscience & American Society for Neurorehabilitation Conference, Baltimore, MD & Washington, DC, USA
- **Liao WW**, Waller SM, Feldman R, & Whitall J. Kinect-based individualized upper extremity rehabilitation is effective in stroke: outcomes and participants' perspectives (Nov 2016). Society for Neuroscience & American Society for

Neurorehabilitation Conference. San Diego, CA, USA

- Feldman R, Waller SM, **Liao WW**, & Whitall J. Telehealth: Collaborating with patients and programmers will optimize a computer-enhanced training system for individuals with chronic stroke (Jun 2016). NEXT APTA Conference, Nashville, TN, USA
- **Liao WW**, Whitall J, Barton J, & Waller SM. Different levels of intracortical inhibition are involved in bimanual common- vs. dual-goal tasks and related to interlimb interaction (Nov 2015). Society for Neuroscience & American Society for Neurorehabilitation Conference, Chicago, IL, USA
- **Liao WW**, Whitall J, Barton J, & Waller SM. Bilateral force deficit is induced in bimanual common-goal but not dual-goal tasks and related to intracortical inhibition (April 2015). Neural Control of Movement Conference, Charleston, NC, USA
- **Liao WW**, Kantak SS, Barton J, & Waller SM. Reduced intracortical inhibition is associated with bimanual common- and dual- goal tasks (Nov 2014). Society for Neuroscience & American Society for Neurorehabilitation Conference, Washington DC, USA
- Waller SM, **Liao WW**, Sorkin J, & Whitall. J. Cluster Analysis as a Means to Show Changes after Upper Extremity Training in Participants with Stroke (Feb 2014). APTA Combined Section Meeting Conference, Las Vegas, NV, USA
- Kantak SS, **Liao WW**, Wittenberg GF, & Waller SM. Posture-related modulation in motor cortical excitability of proximal and distal upper extremity muscles (Oct 2012). American Congress of Rehabilitation Medicine & American Society for Neurorehabilitation Annual Conference, Vancouver, BC, Canada
- Hsieh YW, Lin KC, **Liao WW**, Wu CY, & Wu. KY. A Pilot Study of the Effects of Treatment Intensity in Robot-Assisted Therapy after Stroke (Nov 2010). International Symposium on Occupation-Centered Research and Practice, Taipei, Taiwan.
- **Liao WW**, Lin KC, Hsieh YW, Wu CY, Chang WY, & Lee. CY. Effects of Robot-Assisted Upper-Limb Rehabilitation on Daily Function and Real-World Arm Activity in Patients with Chronic Stroke (Nov 2010). Taiwan Occupational Therapy Association Conference, Taipei, Taiwan.

Best Oral Presentation Award

- **Liao WW**, Lin KC, Hsieh YW, Wu CY, Chang WY, & Lee. CY. Use of Accelerometers as the Outcomes in Robot-Assisted Stroke Rehabilitation (Jun 2010). Occupational Therapist Union, ROC (OTUROC) Conference, Tainan, Taiwan.

專書與其他著作

- 劉倩秀、吳菁宜、廖婉彣（2022）。情境記憶測驗（CMT）中文版。中國行為科學社。

Wan-wen Liao

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Current Position

Assistant Professor, Department of Gerontological Health Care, National Taipei University of Nursing and Health Sciences, Taipei, Taiwan

Bibliography

My current research focuses on using novel brain neuro-technology (e.g., transcranial magnetic stimulation & transcranial direct current stimulation) to improve function of elderly with neurological disorders (stroke) and cognitive impairment (mild cognitive impairment & dementia), and developing precision prediction models using data-driven approaches (e.g. machine learning algorithms) to identify responders and non-responders to contemporary stroke neurorehabilitation. My research goal is to develop precision and personalized rehabilitation interventions to optimize recovery of individuals with neurological and cognitive impairment.

Research

- Stroke neurorehabilitation
- Cognitive rehabilitation
- Artificial intelligence (AI) outcome prediction models in patients
- Translational research using innovative brain neuro-technology, such as non-invasive brain stimulation, robotics and virtual reality-based systems to improve function and quality of life in individuals with neurological and cognitive impairment.

Education

- Doctor of Philosophy
  Physical Rehabilitation Science, University of Maryland Baltimore, Maryland, USA (May 2018)
- Master of Science
  Occupational Therapy, National Taiwan University, Taipei City, Taiwan (Jun 2010)
- Bachelor of Science
  Occupational Therapy, National Cheng-Kung University, Tainan City, Taiwan (Jun 2008)

Certifications

Certified Occupational Therapist, Taiwan Since 2009

Skills

Transcranial Magnetic stimulation (TMS) & Repetitive Transcranial Magnetic Stimulation (rTMS)
Transcranial Direct Current Stimulation (tDCS)
Electromyography (EMG) analysis /Motion Analysis
Clinical Assessments

Honors & Awards

- **Best Research Paper Award -**Taiwan Occupational Therapy Association 2021 Annual Conference, Taipei, Taiwan
- **Graduate Research Award -** University of Maryland Baltimore
- **Travel Fellowship Award -** University of Maryland Baltimore
- **Best Oral Presentation Award -**Taiwan Occupational Therapy Association 2010 Annual Conference, Taipei, Taiwan

Professional Societies

- Taiwan Occupational Therapy Association
- Society for Neuroscience
- American Society for Neurorehabilitation
- American Heart Association
- Society for Neural Control of Movement

Peer Review

- Guest editor for *Frontiers in Rehabilitation Science,* Research topic: Motor Learning in Older Adults and Patient Populations.
- Clinical Rehabilitation
- Disability and Rehabilitation
- Plos One
- OTJR: Occupation, Participation, and Health
- Neurorehabilitation and Neural repair

Grants & Funding

- National Taipei University of Nursing and Health Sciences-Faculty Funding (Feb 2022)
- University of Maryland Baltimore–Graduate Research Award Funding (Feb 2017)
- University of Maryland School of Medicine–Internal Department Funding (Mar 2017)

Publications

- **Liao, W.W.**, Hsieh, Y.W., Lee, T.H. & Wu, C.Y. (2022). Machine learning predicts clinically significant health related quality of life improvement after sensorimotor rehabilitation interventions in chronic stroke. *Scientific Reports*, 12, 11235. **(SCI, IF= 4.996, Rank=19/73, Multidisciplinary Science)**
- Chuang, I.C., **Liao, W.W.**, Wu, C.Y., Yeh, T.T., Chen, C.L., Lin, C.H., Huang, T.H., Pei, Y.C (2022). Baseline Global Cognitive Function Impacts Cognitive and Functional Outcomes of Combined Physical and Cognitive Training in Older Adults with Cognitive Decline. *American journal of occupational therapy,* 76. **(SSCI, IF= 3.776, Rank=33/74, Q2, Rehabilitation)**
- Chen, Y.W., **Liao, W.W.**, Chen, C.L., & Wu, C.Y. (2021). Kinematic descriptions of upper limb function using simulated tasks in activities of daily living after stroke. *Human Movement Science*, 79, 102834. **(SCI, IF=2.161, Rank= 54/77, Q3, Physiology)**
- Thakkar, H. K., **Liao, W.W.,** Wu, C.Y., Hsieh, Y.W., & Lee, T.H. (2020). Predicting clinically significant motor function improvement after contemporary task-oriented interventions using machine learning approaches. *Journal of NeuroEngineering and Rehabilitation,* 17, 131. **Co-first authors. (SCI, IF=5.218, Rank=4/68, Q1, Rehabilitation)**
- **Liao, W.W.,** Chiang, W.C., Lin, K.C., Wu, C.Y., Liu, C.T., Hsieh, Y.W.& Chen, C.L. (2020). Timing-dependent effects of transcranial direct current stimulation with mirror therapy on daily function and motor control in chronic stroke: a randomized controlled pilot study. *Journal of NeuroEngineering and Rehabilitation,* 17, 101. **(SCI, IF= 5.218, Rank=4/68, Q1, Rehabilitation)**
- **Liao, W.W.,** Wu, C.Y., Liu, C.H., Lin, S.H., Chiau, H.Y., & Chen, C.L. (2020). Test-retest reliability and minimal detectable change of the Contextual Memory Test in older adults with and without mild cognitive impairment. *PloS one*, 15,e0236654. **(SCI, IF= 3.227, Rank=21/71, Q2, Multidisplinary sciences)**
- Li, Y. C, **Liao, W. W.,** Hsieh, Y. W., Lin, K. C., & Chen, C. L. (2019). Predictors of Clinically Important Changes in Actual and Perceived Functional Arm Use of the Affected Upper Limb After Rehabilitative Therapy in Chronic Stroke. *Archives of physical medicine and rehabilitation*, 101, 442-449. **(SCI, IF= 4.489, Rank=5/68, Q1, Rehabilitation)**
- **Liao, W. W.**, Whitall, J., Wittenberg, G. F., Barton, J. E.,& McCombe Waller, S. (2019). Not all brain regions are created equal for improving bimanual coordination in individuals with chronic stroke. *Clinical Neurophysiology*, 130, 1218-1230. (**SCI, IF= 4.574, Rank=81/208, Q2, Clinical Neurology)**
- **Liao, W. W**, Whitall, J., Barton, J. E.,& McCombe Waller, S. (2018). Neural motor control differs between bimanual common-goal vs. bimanual dual-goal tasks. *Experimental Brain Research, 236,* 1789-1800. **(SCI, IF= 2.166, Rank=238/293, Q4, Neurosciences)**
- **Liao, W. W.**, McCombe Waller, S., & Whitall, J. (2018). Kinect-based Individualized Upper Extremity Rehabilitation is Effective and Feasible for Individuals with Stroke Using a Transition from Clinic to Home Protocol. *Cogent Medicine*, 5, 1428038. https://doi: 10.1080/2331205x.2018.1428038.
- Kantak, S. S., Wittenberg, G. F., **Liao, W. W**., Magder, L. S., Rogers, M. W., & McCombe Waller, S. (2013). Posture-related Modulations in Motor Cortical Excitability of the Proximal and Distal Arm Muscles. *Neuroscience letters*, 533, 65-70. https://doi: 10.1016/j.neulet.2012.10.048 **(SCI, IF= 2.855, Rank=194/293, Q3, Neurosciences)**
- **Liao, W. W.**, Wu, C. Y., Hsieh, Y. W.. Lin, K. C., & Chang, W. Y. (2012). Effects of Robot-assisted Upper Limb Rehabilitation on Daily Function and Real-world Arm Activity in Patients with Chronic Stroke: A Randomized Controlled Trial. *Clinical rehabilitation*, 26, 111-120. https://doi: 10.1177/0269215511416383 **(SCI, IF=4.193, Rank=10/68, Q1, Rehabilitation)**

- Hsieh, Y. W., Wu, C. Y., **Liao, W. W.**, Lin, K. C., Wu, K. Y., & Lee, C. Y. (2011). Effects of Treatment Intensity in Upper Limb Robot-assisted Therapy for Chronic Stroke: A Pilot Randomized Controlled Trial. *Neurorehabilitation and neural repair*, 25, 503-511. https://doi: 10.1177/1545968310394871 **(SCI, IF=5.378, Rank=6/68, Q1, Rehabilitation)**
- **Liao, W. W.**, Lin, K. H., Hsieh, Y.W., Chuang, L. L., Wu, C. Y., & Lin., K.C. (2010). Effects of Robot-Assisted Therapy in Stroke Rehabilitation: A Systematic Review of Randomized Controlled Trials. *Formosan Journal of Physical Therapy*, 35, 126-138.

Conferences Presentations

- Lin, CY, Liu, CT, Lin SH, **Liao WW,** & Wu CY. Effects and change progressions of transcranial direct current stimulation (tDCS) at premotor cortex versus primary motor cortex with mirror therapy following stroke: A pilot RCT (Dec 2021). European Congress of NeuroRehabilitation 2021 jointly with 27th Annual Meeting of the German Society of NeuroRehabilitation. (Virtual conference).
- Thakkar, H. K., **Liao, W.W.,** Wu, C.Y., Hsieh, Y.W., & Lee, T.H. (Nov 2021). Predicting clinically significant motor function improvement after contemporary task-oriented interventions using machine learning approaches. Taiwan Occupational Therapy Association Conference, Taipei, Taiwan**.**

  Best Research Paper Award Presentation
- Wu, CY, Chuang, IC, & **Liao, WW.** The Application of Virtual Reality in Cognitive Training with the Daily Life Context: Gardening Coach (Dec 2020). The 5th NTU – KU Joint Symposium 2020 AI & Smart Medicine for Digital Health (Virtual conference).
- Wu, CY, **Liao, WW** & Chuang, IC. Domain-specific Improvements of Combined Physical Activity and Cognitive Intervention on Cognitive and Instrumental Activities of Daily Living Function in Older Adults with Mild vs. Moderate-to-severe Cognitive Impairments (Dec 2020). Alzheimer's Disease International (ADI) International Conference 2020, Singapore (Virtual conference).
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  Best Oral Presentation Award
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