

YUAN YANG, PhD**Assistant Professor in Biomedical Engineering, University of Oklahoma**Email: yuan.yang-2@ou.eduLab website: <https://yanglab.oucreate.com>OU Faculty Page: <https://www.ou.edu/coe/sbme/people/yang>**FACULTY APPOINTMENTS**

- Since 08/2020 **Assistant Professor (Tenure-track)** in Biomedical Engineering (Primary), Electrical and Computer Engineering (Adjunct), and Rehabilitation Sciences (Adjunct), University of Oklahoma, Norman/Tulsa/Oklahoma City, Oklahoma.
- Since 08/2020 **Assistant Professor (Adjunct)** in Physical Therapy and Human Movement Sciences, Northwestern University Feinberg School of Medicine, Chicago, Illinois.
- Since 08/2020 **Faculty (Adjunct)** in the Laureate Institute for Brain Research, Tulsa, Oklahoma.
- 07/2017-07/2020 **Assistant Professor (Research)** in Physical Therapy and Human Movement Sciences, Northwestern University Feinberg School of Medicine, Chicago, Illinois.
- Since 07/2020 **Preceptor**, Northwestern University Interdepartmental Neuroscience Program, Chicago, Illinois.
- Since 09/2019 **Faculty Mentor**, Area of Scholarly Concentration for M.D. Education with Specialty/Area of Research in Stroke Rehabilitation, Computational Neuroscience, and Human Movement Control. Northwestern University Feinberg School of Medicine, Chicago, Illinois.
- Since 07/2020 **Affiliated Faculty**, Institute for Innovations in Development Sciences, Northwestern University, Chicago, Illinois.

EDUCATION AND POSTDOC TRAINING

- 2004 – 2008 **Bachelor** in Biomedical Engineering, Central South University, Changsha, China
- 2008 – 2010 **Master** in Biomedical Engineering, Shanghai Jiao Tong University, Shanghai, China
- 2010 – 2013 **Ph.D.** in Signal and Image Processing, Télécom ParisTech, CNRS LTCI, Paris, France.
Thesis: EEG signal analysis for brain-computer interfaces for large public applications.
The level of distinction: *Très honorable*
- 2013 – 2017 **Postdoc** in Biomechanical Engineering, Delft University of Technology, The Netherlands.
Clinical Study Training Sites: VU University Medical Center-Amsterdam (Rehabilitation Sciences), Reinier de Graaf Hospital – Delft (Neurology).

RESEARCH GRANTS/AWARDS**A. Current:**

Agency: NIH / Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)

Program: NIH R21

ID#: 1R21HD099710

Title: Determination of the Recruitment of Indirect Motor Pathways in Chronic Hemiparetic Stroke

Principal Investigators: Dewald, Yang (Multi-PI plan)

Role (FY 22 effort): **MPI (0.05 month)**

Total costs for project period: **\$416,079**

Project period: 07/01/19- 06/30/21 (original funding period), no cost extension to 06/30/22.

Project description: This mechanistic study seeks to quantitatively determine the maladaptive reliance on the contralesional indirect motor descending pathways and its link to post-stroke motor impairment, using EEG, EMG, mechatronic device, and novel signal processing methods. This research provides new knowledge and associated measures that are essential for the development of more effective rehabilitation interventions to combat abnormal limb synergy and spasticity following recovery from a hemiparetic stroke.

Agency: OCAST

Program: Oklahoma Health Program

ID#: HR21-164

Title: Multimodal integration of concurrent high-density EEG-fMRI with diffusion and anatomical MRI to determine dynamic information flow in brain circuits – an application to hemiparetic stroke

Principal Investigator: Yang

Role (FY 22 effort): **PI (0.5 month in kind)**

Total costs for project period: **\$135,000**

Project period: 11/01/21-10/31/24

Project description: Our primary objective is to establish an advanced new tool for precisely tracking sensory information flow in the brain networks and, by that, to improve our understanding of the neural basis of post-stroke motor impairments.

Agency: NIH/ NIGMS

Program: OSCTR Clinical and Translational Research Pilot (CTRP) Grants.

ID#: U54GM104938 - Yang

Title: Targeted HD-tDCS for reducing post-stroke movement impairments

Principal Investigators: Yang, Sidorov

Role (FY 22 effort): **PI (0.5 month) – Project starts, pending for NOA and account setup in OU**

Total costs for project period: **\$72,500**

Project period: 01/01/22-06/30/23

Project description: We propose to run a proof-of-concept pilot trial (clinicaltrials.gov ID: NCT05174949) to evaluate the effect of the targeted HD-tDCS on mitigating the muscle synergy impairment.

B. Pending:

Agency: National Institutes of Health (NIH) / NICHD and/or NINDS

Program: R01 Parent

ID#: R01HD109157 – **Scored 22% (Within NINDS ESI payline, no fixed line for NICHD)**

Title: Shift from Unilateral to Bilateral Sensory-Motor Connectivity in Chronic Hemiparetic Stroke

Principal Investigator: Yang

Role (effort): **PI (4.8 months)**

Total costs for project period: **\$1,902,538**

Project period: 07/01/2022 - 06/30/2027

Project description: The overall goal of the proposed research is to examine the pathophysiology of the maladaptive hemispheric somatosensory “shift” and its relationship to the expression of abnormal limb synergies following a hemiparetic stroke. The results will lead to a novel understanding of abnormal synergies by closing the sensorimotor loop, and thereby should provide a novel means by which to therapeutically manipulate the emergence and expression of abnormal flexion synergy in the paretic arm.

Agency: American Heart Association

Program: Career Development Award

ID#: Pending

Title: Determine the effect of targeted high-definition tDCS on reducing post-stroke upper limb

motor impairments.

Principal Investigators: Yang

Total costs for the project period: **\$231,000**

Role (effort): **PI (1.5 month)**

Project period: 04/01/2022 – 03/30/2025

Project description: The overall objective of this career project is then to investigate how THD-tDCS modulates the specific cortical motor regions and its underlying motor pathways to diminish post-stroke upper limb impairments via following three specific aims.

C. Completed:

Agency: NIH/NIGMS/Laureate Institute for Brain Research (LIBR, PD: Paulus)

Program: CoBRE Pilot

ID # 5P20GM121312-Yang

Title: Probing sex difference in brain networks and the relation with the MAD psychopathology

Principal Investigator: Yang (Pilot)

Role (effort): Pilot **PI (1 summer month)**

Direct costs per year: 50,000 USD

Total cost for project period: **\$77,500**

Project period: 01/01/2021-12/31/2021

Project description: The overall objective of this CoBRE pilot study is to explore 1) whether such morphological differences are associated with sex-related functional differences in the brain and 2) if these sex-related differences (both structural and functional) affect the psychopathology of a specific type of mood and anxiety disorders (MAD), i.e., major depression disorder (MDD).

Agency: Northwestern Memorial Foundation

Program: Dixon Translational Research Award

ID#: SP0051062

Title: Assessment of the Usage of Indirect Motor Pathways in Hemiparetic Stroke

Principal Investigator: Yang

Role (effort): **PI (8.33% FTE)**

Total costs for project period: **35,000 USD**

Project period: 1/1/19-12/31/19

Project description: Using a clinically applicable mechatronic device and novel signal processing methods, this translational research aims to provide clinicians with a relatively easy-to-use tool for the determination of the usage of indirect motor pathways post hemiparetic stroke. This will then facilitate the development of physical rehabilitation treatments for reducing the usage of indirect motor pathways in favor of remaining corticospinal resources from the lesioned hemisphere during recovery from a stroke.

Agency: NIH National Center for Advancing Translational Sciences

ID#: UL1TR001422

Title: Northwestern University Clinical and Translational Research Institute Voucher Program

Principal Investigator: Lloyd-Jones

Role (effort): **PI of a pilot study** (as needed)

PI project title: Pilot data collection for nonlinear analysis of stretch reflex behavior in individuals with chronic hemiparetic stroke

Total costs for project period: 2,500 USD

Project period: 12/21/17-06/30/18

Project description: The goal of this study is to collect pilot data from a few stroke individuals to demonstrate the feasibility of my novel engineering method to quantitatively assess post-stroke spasticity.

INTERNAL RESEARCH SUPPORT

2021 College of Engineering Strategic Research Incentive TA Support
2022 OU Research Incentive Program Postdoc Matching Fund

HONORS AND AWARDS

2014 **Young Investigator Training Program Award (Italy)**, awarded by Federation of European Neuroscience Societies (FENS), International Brain Research Organization (IBRO), and Italian Society for Neuroscience. I am the **only awardee in the Netherlands**.

2015 **EU-Japan Young Researchers Exchange Program Award**, awarded by Japanese Neuroscience Society and FENS, as an outstanding European young researcher.

2016 **EU-Australasia Young Researchers Exchange Program Award**, awarded by Australasian Neuroscience Society and FENS, as an outstanding European young researcher.

2016 **Young Investigator Training Program Award (Denmark)**, awarded by FENS and Danish Society for Neuroscience, **one of two winners in the Netherlands**.

2017 **Hojjat Adeli Award for Outstanding Contributions in Neural Systems** awarded by the World Scientific Publishing Co. and International Journal of Neural Systems.

2017 **Outstanding Reviewer**, awarded by Computers in Biology and Medicine.

2017 **Outstanding Reviewer**, awarded by Neuroscience Letters

2018 **Winner of LooxidVR Happiness Challenge**, awarded by Looxid Labs, a High-Tech company developing a Mobile-powered VR headset combined with eye-tracking and electrical brain signal (EEG) sensors.

SHORT-TERM LAB VISITS AND GLOBAL NETWORKING ACTIVITY

06-07/2014 Robotics, Brain and Cognitive Sciences Department (**Prof. Cristina Becchio**), Italian Institute of Technology, Genova, Italy.

10-11/2015 ATR Brain Information Communication Research Laboratory Group (**Prof. Okita Yamashita**), Kyoto, Japan.

06-07/2016 Department of Neuroscience & Pharmacology (**Profs. Jens Bo Nielsen and Jesper Lundbye-Jensen**), University of Copenhagen, Denmark.

03/2017 System Neuroscience Group (**Prof. Michael Breakspear**), QIMR Berghofer Medical Research Institute, Brisbane, Australia.

TEACHING

2015/09-2017/07 I gave lectures and laboratory classes in the **Master Course “System Identification and Parameter Estimation Q1”** (TUD, code WB2301, 7 EC) for Biomedical Engineering (BME) and BioMechanical Design students, Delft University of Technology, The Netherlands. This course includes biomechanics, system identification, EMG signal processing, MATLAB, and human experiment design.

2017/06	I taught biomechanics and new techniques for assessing stretch reflexes and somatosensory functions in the Dutch Summer School for Motor Control, Delft, The Netherlands.
2019/01-2020/07	I taught the Northwestern DPT course " <u>2019WI PHYS TH 570-5 SEC20 Synthesis Project</u> " to train them on how to use engineering tools (advanced signal processing and mechatronic device) for neuro-rehabilitation research.
2019/10	I taught movement neuroscience and new techniques for assessing functional neural connectivity in the sensorimotor system in the US Dutch Summer School for Motor Control.
2020/08 -	I am teaching OU Biomedical Engineering undergraduate course " <u>Bioelectricity</u> " (OU code: BME 3133, 3 EC). The course teaches the electrophysiology of excitable cells from a quantitative perspective. Topics include the ionic basis of action potentials, quantitative models for nerve and muscle including the Hodgkin-Huxley equations, impulse propagation, synaptic dynamics, source-field relationships, and an introduction to functional electrical stimulation (peripheral and brain), EEG, EMG, and ECG.
2022/01 -	I am teaching OU Biomedical Engineering graduate course " <u>Neural System and Rehabilitation Engineering</u> " (OU code: BME 5970, 3 EC). The course teaches the advanced knowledge of neural control of movement, musculoskeletal system and movement impairment and disability. We discuss the frontiers of rehabilitation engineering including assistive technologies, brain-computer interfaces, regenerative rehabilitation, and machine learning in rehabilitation. The course also teaches the writing skill for NIH/AHA aims page for research projects in the field of rehabilitation engineering.

SERVICE

A. Leadership and Service (leadership positions held, committee service, etc.)

2015	Co-organizer (with Robert Kearney, Eric Perreault and Alfred Schouten), Special Session "System Identification to Unravel Human Motion Control" in the 17th International Federation of Automatic Control Symposium on System Identification, Beijing, China.
2017	Session Chair , the 6th Dutch Conference for Biomedical Engineering, Egmond aan Zee, The Netherlands
2017	Co-organizer (with Frans van der Helm, Alfred Schouten, and Julius Dewald), Dutch Summer School for Motor Control, Delft, The Netherlands.
2019	Co-organizer (with Julius Dewald, CJ Heckman, Lee E Miller, Gert Kwakkel, Frans van der Helm, Alfred Schouten), US Dutch Summer School for Motor Control, Chicago, IL.
Since 2019	Interviewer , Northwestern University Medical Scientist Training Program, Chicago, IL
Since 2020	Seminar Committee Chair and Graduate Study Committee Member , Stephenson School of Biomedical Engineering, University of Oklahoma, Norman, OK
2021	OU Graduate College Representative , a Ph.D. Committee at Department of Health and Exercise Science, University of Oklahoma, Norman, OK

B. Editorial and Review Service

- 2016 - 2017 **Guest Editor**, Special Issue on “Neural Engineering for Rehabilitation” in the Journal “*Behavioural Neurology*”
- 2017- **Editorial broad member**, the journal “*Current Advances in Neurology and Neurological Disorders*”
- 2017- **Review Editor**, the Quantitative Psychology and Measurement, a specialty of the journals “*Frontiers in Applied Mathematics and Statistics*” and “*Frontiers in Psychology*”
- Active **Ad hoc Reviewer**, for **more than 30 SCI journals** including 1) Neurorehabilitation and Neural Repair 2) IEEE Transaction on Neural Systems & Rehabilitation Engineering, 3) Journal of Neurophysiology 4) IEEE Transaction on Biomedical Engineering, 5) IEEE Journal of Biomedical and Health Informatics, 6) NeuroImage, 7) Human Movement Sciences, 8) Frontiers in Neuroscience, 9) Journal of Neuroscience Methods, 10) Prosthetics & Orthotics International, 11) Experimental Brain Research, 12) Neuroscience Letters 13) Expert Systems with Applications, 14) Biomedical Signal Processing and Control, 15) Sensors, 16) International Journal of Computer Assisted Radiology and Surgery, 17) Computers in Biology and Medicine, 18) Neural Computing and Applications, 19) Entropy, 20) PLoS ONE, 21) Brain Sciences, 22) Neurocomputing, 23) International Journal of Neural Systems 24) Frontiers in Psychology, 25) IEEE Access, 26) Journal of Neural Engineering, 27) Journal of Neuroscience Methods, 28) Behavioural Neurology, 29) Cerebral Cortex, 30) IEEE Transactions on Cognitive and Developmental Systems, etc.
- 2020 **International Grant Reviewer**, the Scientific Committee of the Italian Multiple Sclerosis Society (AISM-FISM)
- 2021- **Associated Editor**, Frontiers in Psychology.
- 2021- **Special Topical Editor**, Special issue on “Nonlinear Connectivity, Causality and Information Processing in Neuroscience”, Frontiers in Computational Neuroscience and Frontiers in Neuroinformatics
- 2021 **NIH Early Career Reviewer**
- 2021 **Grant Reviewer**, Clinical & Translational Science Institute of Southeast Pilot Award, Medical College of Wisconsin
- 2021 **Associate Editor**, IEEE EMBS Student Paper Competition Committee at 2021 Annual International Conference of the IEEE Engineering in Medicine and Biology Society - EMBC'21

ADVISING STUDENTS AND RESEARCH STAFF

A. Current research staff, postdoc and graduate students at OU/OUHSC and Northwestern University

1. Runfeng Tian, MSc (Research Associate, OU)

Runfeng received his Master’s degree in Mechanical Engineering (ME)/BioMechanical Design (BMD) from the Delft University of Technology, the Netherlands. He was my graduate student in the Netherlands. He is a clinical research associate, working on the development of a multi-modal brain imaging approach to assess dynamic information flows in the brain network and how they change after a stroke. The results from his work provide preliminary data for a part of my R01 proposal. **Runfeng published two journal papers in “Annal of Biomedical Engineering” and “IEEE Transactions on Neural Systems and Rehabilitation Engineering” with me (the last/corresponding author).**

2. Mustafa Ghazi, PhD. (Postdoc Research, OUHSC)

Mustafa is assisting with non-invasive brain stimulation meta-analysis and robotic rehabilitation system development.

3. **William Andrew (Drew) Sikora (Biomedical Engineering PhD Candidate, OU)**

Drew graduated from UT Austin and got **Gallogly College of Engineering Ph.D. Recruitment Excellence Fellowship** to join my lab in OU-Tulsa. He is working on neuroimaging and rehabilitation projects for stroke and major depression disorders.

4. **Beni Mulyana (Electrical and Computer Engineering, PhD Candidate, OU, co-mentored with Dr. Samuel Cheng)**

Beni was a student working with Dr. Jerzy Bordurka (LIBR 1964-2021). He is now working with me to complete his PhD on a neuromodulation project with LIBR.

5. **Nasrin Akter (Electrical and Computer Engineering, PhD Candidate, OU, co-mentored with Dr. Hazem Refai)**

Nasrin is working on brain lesion segmentation and modeling using deep learning.

6. **Nishaal Parmar (Electrical and Computer Engineering, PhD Candidate, OU, co-mentored with Dr. Hazem Refai)**

Nishaal is working on a nonlinear system identification project co-chaired by Prof. Hazam Refai and myself.

7. **Jordan Williamson (Biomedical Engineering, Master Candidate, OU)**

Jordan is working on my secondary performance site at Neurology unit at Oklahoma City for OSCTR neuromodulation (transcranial direct current stimulation - tDCS) clinical trial project ([clinicaltrials.gov ID: NCT05174949](https://clinicaltrials.gov/ct2/show/study/NCT05174949)) in stroke.

8. **Grace Duginski (Biomedical Engineering, Master Candidate, OU)**

Grace is working on vibration-based wearable device design for stroke rehabilitation at my satellite lab in OUHSC Allied Health.

9. **Justin Sharma (Biomedical Engineering, Master Candidate, OU)**

Justin is working on wearable exoskeleton robot design for stroke rehabilitation at my satellite lab in OUHSC Allied Health.

10. **Aaron Monroe (Doctor of Physical Therapy Student, OUHSC)**

Aaron is assisting with clinical assessment in stroke at my satellite lab in OUHSC Allied Health.

11. **Thomas Plaisier, MEng (BME Ph.D. Candidate, Northwestern, Co-Mentored with Dr. Julius Dewald)**

Thomas is completing his Ph.D. in biomedical engineering under the co-mentoring of Prof. Dewald and myself. He is investigating the transcortical stretch reflex in stroke, using EMG and a multi-degree freedom robot. He is receiving support from the NIH R21.

B. Completed Ph.D. Rotation/DPT projects/Master Theses/Student Projects (including previous students at TU Delft)

1. **Nirvik Sinha, MD, MS (Neuroscience Ph.D. Candidate, Northwestern)**

Nirvik was working on the modeling of motor descending pathways and human subject experiments to provide preliminary data for a part of my R01 and NSF CAREER proposal. He was also doing realistic spinal circuit modeling with Dr. CJ Heckman (Prof. in Physiology) and myself for a spinal cord injury model. He has two first-author papers **with me (the corresponding/last author)** in “**IEEE Transactions on Neural Systems and Rehabilitation Engineering**” (stroke research) and “**Journal of Theoretical Biology**” (spinal cord modeling). After I left Northwestern, he is transferred to work with Dr. Julius Dewald.

2. **Raghuveer Chandrashekar (Rehabilitation Sciences Ph.D. Candidate, OU)**

Raghu is a Ph.D. student under Dr. Hongwu Wang (OUHSC Rehab. Sciences). He was doing his reach intern in my lab for a stroke rehabilitation project using a Biodex system and robotic device. He left OUHSC and moved with Dr. Wang to University of Florida.

3. **Ramya Sai Vuyyuru (Computer Science Master Student, OU)**

Ramya is a Data Sciences Master's student. She was working on neuroimaging and meta-analysis for Alzheimer's diseases and non-invasive brain stimulation.

4. **Alexander Cates (Neuroscience Ph.D. lab rotation, 2019)**

Alex's lab rotation project with me was to investigate the neural mechanism of tDCS and its applications to motor learning and stroke rehabilitation. **He has a conference abstract accepted for BMES Annual Meeting 2019, Philadelphia.**

5. **Doctor of Physical Therapy Research Project Students: Michael Henderson, Olivia Do, Emily Biederman, Collin Fligge, Kaitlyn Rance (Northwestern).**

They are investigating sensory impairment post-stroke using a mechatronic device and electrical finger stimulation under my mentorship.

6. **Mark Quinlan Cummings (Lab Assistant, Biology BS)**

Mark is investigating how damage to the cortico-spinal tract affects motor unit firing and coupling, using EMG array electrodes and ICA decomposition algorithm, under my supervision.

7. **Caroline Machenbach (last year MD and ME/BMD MS)**

Caroline worked on computational models of transcranial direct current stimulation (tDCS) to identify the optimal montage of stimulation for motor learning and stroke rehabilitation. Her work provided preliminary data for the third aim in my R01 proposal. **Her work leads to a full conference paper published at the IEEE EBMC conference in 2020.**

8. **Nirvik Sinha, MD (BME Master's thesis 2019, US-India Khorana Scholar 2018)**

Nirvik has an M.D. background and did his Master's graduation research project with Profs. Dewald, Heckman, and myself. He worked on computational modeling of multi-synaptic neural systems, which leads to a better understanding of the usage of backup indirect motor pathways (e.g. cortico-bulbospinal tracts) following a unilateral brain injury. **He has a first-author paper with me (the corresponding/last author) published with the journal "Frontiers in System Neuroscience" during his intern. He has been accepted for Ph.D. in Neuroscience at Northwestern University.**

9. **Bhavya Vasudeva (EE undergraduate intern, US-India S.N. Bose Scholars 2019)**

Bhavya did her intern with me to develop a generalized phase synchronization method that allows assessing various types of phase coupling including integer and non-integer harmonics and intermodulation. **She has a first-author paper with me (the corresponding/last author) published in the journal "Biomedical Signal Processing and Control".**

10. **Catherine Hendrica Elizabeth Yvonne Hogenhuis (ME/BMD Master Intern 2019)**

Catherine did her Master's Intern with me on investigating non-invasive brain stimulation interventions for motor rehabilitation post hemiparetic stroke. **She has an abstract with me accepted for an oral presentation at BMES Annual Meeting 2019, Philadelphia, PA.**

11. **Runfeng Tian (ME/BMD Master's thesis 2018, Delft University of Technology).**

Runfeng did his MS thesis with me (primary mentor) on the topic of "Brain Dynamic Information Flow Estimation Based on EEG and Diffusion MRI". **Runfeng published two journal papers in "Frontiers in Computational Neuroscience" and "Frontiers in Neural Circuits" with me (the corresponding author) during his Master's thesis.**

12. **Pablo Maceira Elvira (BME Master's thesis 2017, Delft University of Technology)**

Pablo did his MS thesis with me (primary mentor) on the topic of “Neural Dynamics based on EEG and diffusion MRI”. **Pablo’s work was accepted for an oral presentation in BaCi 2017, Bern, Switzerland, and was admitted for Ph.D. in Neuroscience at the Swiss Federal Institute of Technology (EPFL), Switzerland.**

13. Bekir Guliyev (BME Master's thesis 2017, Delft University of Technology)

Pablo did his MS thesis with me (primary mentor) on the topic of “Quantifying Effective Connectivity during the Cortical Intervention to Stretch Reflex”. **Bekir published one journal paper in “Frontiers in Neuroscience” with me (the corresponding author) during his Master’s thesis.**

14. Ioannis Petridis (BME Master's thesis 2017, Delft University of Technology)

Ioannis did his MS thesis with researchers at Leiden University (Michel D. Ferrari, MD, Ph.D. Professor of Neurology) and me on the topic of “Nonlinear dynamics in the steady-state visual evoked response: methodology and clinical relevance in migraine”.

15. Leonidas Eleftheriou (BME Master Internship, 2016)

Leonidas was Master Student in TU Berlin (Prof. Benjamin Blankertz). He did his Master's internship with me at Delft to investigate the nonlinear dynamics in human movement control.

16. Maryam Afifah and Thijs Blad (BS Medical Delta minor project, 2015)

Maryam and Thijs Blad did their BS project with me on the topic of “Unravelling cortical network effects of transcranial direct current stimulation on motor learning”. **They won the best presentation prize in the Symposium of Medical Delta Minor Project 2015, Rotterdam, The Netherlands.**

Dr. Yuan Yang’s Publication List

[Yuan Yang - Google Scholar](#)
[My Bibliography - NCBI \(nih.gov\)](#)

A. Peer-reviewed Journal Publications (total: 40)

1. Vasudeva B, Tian R, Wu D.H., James S.A., Refai, H.H., Ding L, **Yang Y** (2022), Multi-Phase Locking Value: A Generalized Method for Determining Instantaneous Multi-Frequency Phase Coupling, *Biomedical Signal Processing and Control*, 74 (2022): 103492 (**impact factor: 3.88**).
2. Gao Y, Tang, Y, Zhang H, **Yang Y**, Dong, T, Jia Q (2022), Sex Differences of Cerebellum and Cerebrum: Evidence from Graph Convolutional Network, *Interdisciplinary Sciences: Computational Life Sciences*, In press, DOI: 10.1007/s12539-021-00498-5 (**impact factor: 2.233**).
3. Tian R, Dewald J.P.A. **Yang Y** (2021), Assessing the usage of indirect motor pathways following a hemiparetic stroke, *IEEE Trans Neural Syst Rehabilitation Eng*; 29:1568-72 (**impact factor: 3.34**).
4. He, F., **Yang, Y.** (2021). Nonlinear System Identification of Neural Systems from Neurophysiological Signals. *Neuroscience*. 458: 213-228, PMID: 33309967, PMCID: PMC7925423 (**impact factor: 3.056**).
5. Tian R, Dewald J.P.A, Sinha N, **Yang Y** (2021), Assessing neural connectivity and associated time delays of muscle responses to continuous position perturbations, *Annals of Biomedical Engineering*, 49(1):432-440. PMID: 32705425, PMCID: PMC7775285 (**impact factor: 3.324**).
6. Bao S, Chen C, Yuan K, **Yang Y**, Tong R. K-Y (2021), Disrupted Cortico-peripheral Interactions after Motor Dysfunction, *Clin. Neurophysiol.*, 132(12): 3136-3151 (**impact factor: 3.708**).
7. Li, Y., Yang, X., Zhou, Y., Chen, J., Du, M. and **Yang, Y** (2021). Adaptive stimulation profiles modulation for foot drop correction using functional electrical stimulation: a proof of concept study. *IEEE Journal of Biomedical and Health Informatics*, 25(1):59-68, PMID: 32340970 (**impact factor: 5.223**).

8. Sinha N, **Yang Y** (2021), Strategic Diversification for Asynchronous Asset Trading: Insights from Generalized Coherence Analysis of Cryptocurrency Price Movements, *Ledger*, 6: 102-125.
9. Gu Y, **Yang Y**, Dewald J.P.A, van der Helm F.C.T., Schouten A.C., and Wei H-L (2021), Nonlinear Modeling of Cortical Responses to Mechanical Wrist Perturbations using the NARMAX Method, *IEEE Transactions on Biomedical Engineering*, 68(3): 948-958, PMID: 32746080 (**impact factor: 4.424**).
10. Mukli P, Csipo T, Lipecz A, Stylianou O, Racz F.S, Owens C, Perry C, Tarantini S, Sorond F.A, Kellawan J.M, Purebl G, **Yang Y**, Sonntag W.E, Csiszar A, Ungvari Z, Yabluchanskiy A. (2021) Sleep deprivation alters task-related changes in functional connectivity of the frontal cortex: a near-infrared spectroscopy study, *Brain Behav*, 11(8):e0213, PMID: 34156165, PMCID: PMC8413792 (**impact factor: 2.091**).
11. **Yang Y**, Sinha N, Tian R, Gurari N, Drogos JM, Dewald J.P.A. (2020), Quantifying altered neural connectivity of the stretch reflex in chronic hemiparetic stroke. *IEEE Transactions on Neural System and Rehabilitation Engineering*, 28(6): 1436-1441, PMID: 32275603, PMCID: PMC7340533 (**impact factor: 3.34**).
12. Sinha, N., Heckman, C., **Yang, Y.** (2020). Slowly activating outward membrane currents generate input-output sub-harmonic cross frequency coupling in neurons. *Journal of Theoretical Biology*, 509, 110509. PMID: 33022285, PMCID: PMC7704641 (**impact factor: 2.327**).
13. Sinha N, Heckman C.J, Dewald J.P.A, **Yang Y** (2020), Cross-frequency coupling in descending motor pathways: theory and simulation, *Frontiers in System Neuroscience*, 13:86, PMID: 31992973, PMCID: PMC6971171 (**impact factor: 3.293**).
14. **Yang Y**[†], Yao J, Dewald J.P.A, van der Helm F.C.T, Schouten A.C, Quantifying the Nonlinear Interaction in the Nervous System based on Phase-locked Amplitude Relationship, *IEEE Transactions on Biomedical Engineering*, 67(9): 2638-2645, PMID: 31976876, PMCID: PMC7363527 (**impact factor: 4.424**).
15. Xiong B, Zeng N, Li Y, Du M, Huang M, Shi W, Mao G, **Yang, Y** (2020). Determining the Online Measurable Input Variables in Human Joint Moment Intelligent Prediction Based on the Hill Muscle Model. *Sensors*, 20(4), 1185, PMID: 32098065, PMCID: PMC7070854 (**impact factor: 3.275**).
16. Yuan, D., Li, Y., Wang, T., Chen, J., Chen, D., Lin, D., & **Yang, Y.** (2020). A closed-loop electrical stimulation system triggered by EOG for acupuncture therapy. *Systems Science & Control Engineering*, 8(1), 128-140 (**impact factor: 1.96**).
17. Li Y, Chen J, and **Yang Y** (2019), A method for suppressing electrical stimulation artifacts from electromyography, *International Journal of Neural Systems*, 29(6): 1850054, PMID: 30646793 (**impact factor: 5.604**).
18. Xin J, Zhang XY, Tang Y and **Yang Y** (2019), Brain differences between men and women evidence from deep learning, *Frontiers in Neuroscience*, 13:185, PMID: 30906246, PMCID: PMC6418873 (**impact factor: 3.707**).
19. Chen X, Chen J, Liang J, Li Y, Courtney C.A, **Yang Y**[†] (2019), Entropy-based Surface Electromyogram Feature Extraction for Knee Osteoarthritis Classification, *IEEE Access*, 7, 164144 – 164151 (**impact factor: 3.745**).
20. Xiong B, Li Y, Huang M, Shi W, Du M, **Yang Y**[†] (2019), Feature selection of input variables for intelligence joint moment prediction based on particle swarm optimization, *IEEE Access*, 7, 182289-182295 (**impact factor: 3.745**).
21. Xiong B, Zeng N, Li H, **Yang Y**, Li Y, Huang M, Shi W, Du M, Zhang, Y (2019), Intelligent prediction of human lower extremity joint moment: an artificial neural network approach, *IEEE Access*, 7, 29973-29980 (**impact factor: 3.745**).
22. Filatova OG*, **Yang Y***, Dewald JPA, Tian R, Maceira-Elvira P, Takeda Y, Kwakkel G, Yamashita O, and van der Helm FCT (2018), Dynamic information flow based on EEG and diffusion MRI in stroke:

a proof-of-principle study, *Frontiers in Neural Circuits*, 2018; 12: 79. PMID: PMC6174251, PMID: 30327592 (***co-first authorship, impact factor: 3.156**).

23. Tian, R*, **Yang, Y***, van der Helm, F.C. and Dewald, JPA (2018). A novel approach for modeling neural responses to joint perturbations using the NARMAX method and a hierarchical neural network. *Frontiers in Computational Neuroscience*, 12: 96. PMID: PMC6291451 (***co-first authorship, impact factor: 2.535**).
24. **Yang Y**, Dewald, J. P. A., van der Helm, F. C. T and Schouten, A. C (2018), Unveiling neural coupling within the sensorimotor system: directionality and nonlinearity. *European Journal of Neuroscience*, 48(7): 2407-2415. PMID: 28887885 PMID: 28887885 (**impact factor: 3.115**).
25. Gursel Ozmen N., Gumusel L. and **Yang Y** (2018). A Biologically Inspired Approach to Frequency Domain Feature Extraction for EEG Classification. *Computational and Mathematical Methods in Medicine*, 2018: 9890132. PMID: PMC5896285, PMID: 29796060 (**impact factor: 1.77**).
26. Tang Y, Liu B, **Yang Y**, Wang C, Li M, Tang B, Guo J (2018). Identifying mild-moderate Parkinson's disease using whole-brain functional connectivity, *Clinical Neurophysiology*, 129(12):2507-2516, PMID: 30347309 (**impact factor: 3.214**).
27. **Yang Y**, Guliyev B and Schouten AC (2017) Dynamic Causal Modeling of the Cortical Responses to Wrist Perturbations. *Frontiers in Neuroscience*, 11:518. PMID: 28955197 PMID: PMC5601387 (**impact factor: 3.707**).
28. **Yang Y** Chevallier S, Wiart J and Bloch I (2017), Subject-specific time-frequency selection for multi-class motor imagery-based BCIs using few Laplacian EEG channels, *Biomedical Signal Processing and Control*, 38, 302-311 (**impact factor: 3.137**).
29. **Yang Y**, Solis-Escalante T, Yao J, Daffertshofer A, Schouten A.C., and van der Helm F.C.T. (2016), A general approach for quantifying nonlinear connectivity in the nervous system based on phase coupling, *International Journal of Neural Systems*, 26 (1): 1550031. PMID: 26404514 (**impact factor: 5.604**).
30. **Yang Y**, Solis-Escalante T, Yao J, van der Helm F.C.T, Dewald J.P.A and Schouten A.C (2016), Nonlinear Connectivity in the Human Stretch Reflex Assessed by Cross-frequency Phase Coupling, *International Journal of Neural Systems*, 26(8): 1650043, PMID: 27440467 (**impact factor: 5.604**).
31. **Yang Y**, Solis-Escalante T, van der Helm F.C.T, Schouten A.C (2016), A generalized coherence framework for detecting and characterizing nonlinear interactions in the nervous system, *IEEE Transactions on Biomedical Engineering*, 63(12): 2629-2637, PMID: 27362753 (**impact factor: 4.424**).
32. **Yang Y**, Solis-Escalante T, van de Ruit M, van der Helm F.C.T and Schouten A.C (2016), Nonlinear coupling between cortical oscillations and muscle activity during isotonic wrist flexion, *Frontiers in Computational Neuroscience*, 10:126. PMID: 27999537 PMID: 27999537 (**impact factor: 2.535**).
33. **Yang Y**, Bloch I, Chevallier S, Wiart J (2016), Subject-specific channel selection using time information for motor imagery brain-computer interfaces, *Cognitive Computation*, 8(3), 505-518 (**impact factor: 4.307**).
34. **Yang Y**, Qiu Y and Schouten A.C (2015). Dynamic functional brain connectivity for face perception. *Frontiers in Human Neuroscience*, 9:662. PMID: 26696870 PMID: 26696870 (**impact factor: 2.673**).
35. Ansuini C, Cavallo A, Koul A, Jacono M, **Yang Y**, Becchio C (2015), Predicting object size from hand kinematics: a temporal perspective, *PLoS ONE*, 10 (3): e0120432. PMID: 25781473 PMID: 25781473 (**impact factor: 2.74**).
36. **Yang Y**, Chevallier S, Wiart J, Bloch I (2014), Time-frequency optimization for discrimination between imagination of right and left hand movements based on two bipolar electroencephalography channels, *EURASIP Journal on Advances in Signal Processing*, 2014:38 (**impact factor: 1.14**).

37. Guo H, **Yang Y**, Gu G, Zhu Y, Qiu Y (2013), Phosphene object perception employs holistic processing during early visual processing stage, *Artificial Organs*, 37(4): 401-408. PMID: 25781473, PMCID: 25781473 (**impact factor: 2.259**).
38. **Yang Y**, Gu G, Guo H, Qiu Y (2011), Early event-related potential components in face perception reflect the sequential neural activities, *Acta Physiologica Sinica*, 63(2): 97-105. PMID: 21505723.
39. Guo H, Wang Y, **Yang Y**, Tong S, Zhu Y, Qiu Y (2010), Object recognition with distorted prosthetic vision, *Artificial Organs*, 34(10): 846-856. PMID: 20545671 (**impact factor: 2.259**).
40. Zhao Y, **Yang Y**, Wang K (2009), Iterative multi-level image segmentation based on fuzzy set theory, *Journal of Optoelectronic · Laser*, 20 (10): 1403-1409 (Chinese).

B. Editorial Commentary:

1. Hu X, Zhao T, Yao J, Kuang Y, **Yang Y** (2018), Advances in Neural Engineering for Rehabilitation, *Behavioural Neurology*, 2018: 9240921 PMID: 29422721 PMCID: 29422721.

C. Peer-reviewed book chapter:

1. **Yang Y**, Neural coding by electroencephalography (EEG), In X. Hu (Ed.), *Intelligent Biomechanics in Neurorehabilitation*, 1st edition. Elsevier, USA. 2020. pp 41-49.

D. Dataset:

1. Schouten AC, Vlaar M, Solis-Escalante T, **Yang Y**, van der Hem FCT (2019), Cortical response evoked by wrist joint manipulation, *Nonlinear System Identification Benchmarks*, Doi: 10.4121/uuid:176d8f78-d9fd-491e-90e7-9370e249b701.

E. Selected Conference Proceeding from over 80 abstracts/conference papers

1. **Yang Y.**, Sidorov E.V., Dewald J.P.A, Targeted tDCS reduces the expression of the upper limb flexion synergy in chronic hemiparetic stroke, American Congress of Rehabilitation Medicine (ACRM) Annual Conference: Progress in Rehabilitation Research, September 26-29, 2021.
2. **Yang Y**, Tian R, Sanha N, Gurari N, Drogos J, Dewald J.P.A (2020). Determining the Increased Usage of Indirect Motor Pathways in Hemiparetic Stroke, *American Physical Therapy Association (APTA) Combined Sections Meeting (CSM)*, accepted for Platform presentation in Research Section, Feb 12-15, 2020, Denver, CO, ID 24201.
3. Mackenbach, C., Tian, R. and **Yang, Y.** (2020). Effects of Electrode Configurations and Injected Current Intensity on the Electrical Field of Transcranial Direct Current Stimulation: A Simulation Study. In *2020 42nd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)* pp. 3517-3520.
4. Shi, Wuxiang, Baoping Xiong, Meilan Huang, Min Du, and Yuan Yang. An Extreme Learning Machine Method for Diagnosis of Patellofemoral Pain Syndrome. In *International Conference on Extreme Learning Machine*, pp. 22-30. Springer, Cham, 2019.
5. **Yang Y**, Tian R*, Cummings M, Drogos J, Dewald J.P.A (2019). Transcranial direct current stimulation over lesioned motor cortices reduces the expression of the flexion synergy and nonlinear brain-muscle connectivity in hemiparetic stroke. *American Society of Neurorehabilitation (ASNR) Annual Meeting*; October 16-18, 2019; Chicago, IL. no. T50.
6. **Yang Y***, Tian R, Cummings M, Hogenhuis C.H.E.Y, Deol J, Drogos J, Dewald J.P.A (2019). Determine the usage of indirect motor pathways following a hemiparetic stroke: A pilot study. *Neuroscience 2019*; October 19-23, 2019; Chicago, IL. no. 5134.

7. **Yang Y***, Hogenhuis C.H.E.Y, Tian R, Cates A, van de Herm F.C.T, Dewald J.P.A (2019). Effects of Electrode Distance and Injected Current Intensity on High-definite tDCS: A Simulation Study. *BMES Annual Meeting*; October 16-19, 2019; Philadelphia, PA, no 559.
8. Tian R, Dewald J.P.A., Sinha N, **Yang Y*** (2019), Assessing linear and nonlinear connectivity and associated time delays in the muscle responses to continuous elbow joint perturbations, *BMES Annual Meeting*; October 16-19, 2019; Philadelphia, PA, no 214.

INVITED LECTURES (International/National)

1. Title ""Neural Assessments and Targeted Interventions for Hemiparetic Stroke," Seminar in Coventry University, Coventry, UK, November 27, 2020.
2. Title "Assessing Functional Neural Connectivity in Hemiparetic Stroke", lecture in Department of Kinesiology and Applied Physiology/Physical Therapy/Biomechanics and Movement Science/ Psychological & Brain Sciences, University of Delaware, Oct. 16, 2019, Invited by Dr. Hyosub Kim and Prof. John Jeka.
3. Title "Quantifying neuronal connectivity in the nervous system using cross-frequency coupling metric and multisine stimulations", lecture in Physical Therapy & Human Movement Sciences Department, Northwestern University, Chicago, July 11, 2016, invited by Prof. Julius P.A. Dewald.
4. Title "Quantifying neuronal connectivity in the nervous system using cross-frequency coupling metric and multisine stimulations", lecture in Department of Neuroscience & Pharmacology, University of Copenhagen, Denmark, June 30, 2016, invited by Dr. Jesper Lundbye-Jensen (Associate Professor).
5. Title "Quantifying connectivity in motor control using connectivity measures and multisine stimulations", lecture in ATR, Kyoto, Japan, Oct. 27, 2015, invited by Prof. Okito Yamashita.
6. Title "Quantifying nonlinear connectivity in the human sensorimotor system", talk in "*Principles of Autonomous NeuroDynamics*" *SEIN Annual meeting*, Heemstede, The Netherlands, July 13, 2015, invited by Dr. Stilian Kalitzin (Associate Professor).
7. Title "Quantifying connectivity in motor control using causality measures and multisine perturbations", lecture in Italian Institute of Technology, Genova, Italy, June 09, 2014, invited by Prof. Cristina Becchio.
8. Title "Subject-specific optimization in brain-computer interfaces", presentation in Labex DigiCosme-Paris-Saclay Research Day, Bures-sur-Yvette, France, July 10, 2013, invited by Prof. Michel Sebag.