

## Dr. Ananda Sidarta

Senior Research Scientist  
Rehabilitation Research Institute of Singapore  
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### EDUCATION

Doctor of Philosophy (Ph. D.) in Neuroscience McGill University, Canada. Thesis advisor: Prof. David J. Ostry	08/2012 - 10/2018
Master of Science (M. Sc.) in Biomedical Engineering Nanyang Technological University, Singapore	07/2007 - 05/2009
Bachelor of Engineering. (B. Eng., Hons) in Electronics Engineering Nanyang Technological University, Singapore	07/2000 - 05/2004

### RESEARCH INTERESTS

Movement is a fundamental human need, regardless of age. Whether the movement involves reaching and grasping or ambulation and socialising, it relies on the sensorimotor system and cognitive ability. I am interested in quantifying and enhancing human performance in the context of neurorehabilitation using modern rehabilitation technology, with an interest in neural plasticity underlying skill learning.

### PROJECT GRANTS

- |  |                   |
|--|-------------------|
| 1. Early Career Research Fellowship Program (S\$ 237,500)<br><i>Act.Sens – active sensorimotor training for chronic stroke survivors</i><br>Role: Principal Investigator<br>Funder: A*STAR/NHG/NTU – Rehabilitation Research Grant Call  | 10/2019 - 03/2023 |
| 2. Future Health Technologies, Module 3 (S\$ 1,59mil)<br><i>Deep phenotyping of upper limb sensorimotor recovery in Asian stroke survivors</i><br>Role: Scientific lead (Lead PI: Dr Nicole Wenderoth, Dr Karen Chua, Dr Ang Wei Tech)<br>Funder: National Research Foundation, CREATE Programme | 06/2023 - 02/2026 |

### AWARDS & SCHOLARSHIPS

- |  |             |
|--|-------------|
| 1. Meeting Support Award to NCM 2023, Canada<br>Source: Society for the Neural Control of Movement                                     | 2023        |
| 2. Teaching Assistant Award<br>Source: Department of Psychology, McGill University   | 2018        |
| 3. Returning Student Fellowship – C\$ 10,000<br>Source: Interdisciplinary Program in Neuroscience, McGill University                   | 2016        |
| 4. Research Mobility Award to Seattle, USA<br>Source: Department of Psychology, McGill University                                      | 2013        |
| 5. Graduate Excellence Scholarship in Neurology & Neurosurgery<br>Source: Interdisciplinary Program in Neuroscience, McGill University | 2012 - 2015 |
| 6. Molson & Hilton Hart Fellowship – C\$ 8,500<br>Source: Faculty of Science, McGill University  | 2012        |
| 7. Certificate of Excellence in Biomedical Engineering<br>Source: Graduate School, Nanyang Technological University                    | 2009        |

**ACADEMIC SERVICES**

1. Undergraduate mentorship 2020 – now
  - LKC School of Medicine: Russell A. Wong (2021), Wong Q.H.<sup>^</sup> (2022), Sng Q.W. (2022), Daniel J. (2023), G. Barath (2023), Isaac Kuah (2023)  
<sup>^</sup>: commended for outstanding work in ‘EEG profiling for balance perturbation’
  - NTU Mech Engineering: Enoch L. (2020), Tan C.Y. (2021), Wong Z.W. (2022), Sim J.L. (2022)
2. Ad-hoc journal reviewer 2019 – now
  - *PLOS One*
  - *Journal of NeuroEngineering and Rehabilitation*
  - *Heliyon*
  - *npj Science of Learning*
  - *Brain Sciences*
  - *IEEE ICORR*
3. Other engagement
  - Assistive and Rehabilitation Technology Student Innovation Challenge, ART-SIC, Singapore (event organizer) 2019
  - BrainReach Montreal for P.E. Trudeau Elementary School, Canada 2015 – 2016
  - Red Cross Blood Donation Drive, Singapore (volunteer) 2007 – 2009
4. Teaching Assistantship (TA), Department of Psychology, McGill University 2012 – 2017
  - Introduction to Statistics
  - Sensorimotor Behavior
  - Sensory Perception
  - Statistics for Experimental Design
  - Intro. to Behavioral Neuroscience
5. Professional affiliations  
 Society for Neuroscience, Society for the Neural Control of Movement, American Congress of Rehabilitation Medicine

**RESEARCH APPOINTMENTS**

- Senior Research Scientist (Rehabilitation Research Institute of Singapore) 08/2024 – now
- Senior Research Fellow (Rehabilitation Research Institute of Singapore) 06/2023 – 07/2024
- Research Fellow (Rehabilitation Research Institute of Singapore) 12/2018 – 05/2023
- Project Officer (BioRobotics Lab, Nanyang Technological University) 05/2008 – 12/2009

**CORE SKILLS**

- Human behavioural experiments: healthy adults, stroke survivors, and ageing cohorts
- R and Python (statistical analyses & applied machine learning), MATLAB (signal processing)
- Analysis of neuroimaging datasets from functional MRI and EEG
- Experience in conducting standardized assessments and analysis of motion capture datasets
- Experience in operations management of a research institute

**PUBLICATIONS**

- Peer-reviewed journal (\* denotes equal contribution)
1. **Sidarta, A.**, Soh, L. J., Lie, E., Kwong, W. H. P., Yeh, I. L., Liang, P., & Ang, W. T. (2025). Establishing normative pinch and grip strengths across adult age groups in Singapore. *BMC Sports science, Medicine & Rehabilitation*, 17(1), 84. [PMID: 40229663. DOI: 10.1186/s13102-025-01140-3]
  2. **Sidarta, A.**, Lim, Y. C., Kuah, C. W. K., Chua, K. S. G., & Ang, W. T. (2025). “Relearning Upper Limb Proprioception After Stroke Through Robotic Therapy: A Feasibility Analysis”. *Journal of Clinical Medicine*, 14(7), 2189. [PMID: 40217638. DOI: 10.3390/jcm14072189]

3. Zhang, L., **Sidarta, A.**, Wu, T. L., Jatesiktat, P., ..., Ang, W.T. (2025). “Towards Clinical Application of Enhanced Timed Up and Go with Markerless Motion Capture and Machine Learning for Balance and Gait Assessment”. *IEEE Biomedical & Health Informatics*. [DOI: 10.1109/JBHI.2025.3543095]
4. Li, J., Kwong, P. W., Lin, W., Fong, K. N., Wu, W., & **Sidarta, A.** (2025). “Assessment of ambulation functions through kinematic analysis in individuals with stroke: a systematic review”. *Eur J. Physical and Rehab Med*, 61(1), 28–40. [PMID: 40008910. DOI: 10.23736/S1973-9087.25.08767-2]
5. Premchand, B., Zhang, Z., Ang, K. K., Yu, J., Tan, I. O., ... **Sidarta, A.**, Kwong, P.W.H. & Chung, L. H. C. (2025). “A Personalized Multimodal BCI–Soft Robotics System for Rehabilitating Upper Limb Function in Chronic Stroke Patients”. *Biomimetics*, 10(2), 94. [PMID: 39997117. DOI: doi.org/10.3390/biomimetics10020094]
6. Soh, L.J., Lim, L.S, Law, W.C., Lau, J.L., Lie, E., Yeh, I.L., Gonzalez, P.C., **Sidarta, A.**, Ang, W.T. (2024). “Technical Properties of a Sensor-Aided Key Rig for Hand Function Measurement: A Proof of Concept Study”. *IEEE Sensors Journal*. [ DOI: 10.1109/JSEN.2024.3494814.]
7. Kwong, W.H., Li, J.Q., Lui, C.H., Luk, H.T., Lau, K.F., Seaby, R., **Sidarta, A.** (2024). “Reliability and Convergent Validity of Endurance Indices Derived from Near-Infrared Spectroscopy and Electromyography during a Bilateral Hanging Task in Amateur Rock Climbers”. *J. Funct. Morphol. Kinesiol.*, 9, 161. [PMID: 39311269. DOI: 10.3390/jfmk9030161]
8. Pan, J.W., **Sidarta, A.**, Wu, T-L, Kwong, W.H.P., Ong, P.L., Tay, M.R.J., Phua, M.W., Chong, W.B., Ang, W.T., and Chua, K.S.G. (2024). “Unraveling stroke gait deviations with movement analytics, more than meets the eye: a case control study”. *Frontiers in Neuroscience*, 18:1425183. [PMID: 39104608. DOI: 10.3389/fnins.2024.1425183]
9. Cheng, H.J., Chin, L.F., Kanzler, C.M., Lehner, R., Kuah, C.W., Kager, S., Josse, E., Samkharadze, T., **Sidarta, A.**, ... et al. (2023). “Upper limb sensorimotor recovery in Asian stroke survivors: a study protocol for the development and implementation of a Technology-Assisted dIgitaL biOmaRker (TAILOR) platform.” *Frontiers in Neurology*, 14, 1246888. [PMID: 38107648. DOI: 10.3389/fneur.2023.1246888]
10. Li, J.Q., Sun, Y.W., So, W.S., **Sidarta, A.**, Kwong, P.W.H. (2022). “A Comprehensive Appraisal of Meta-Analyses of Exercise-Based Stroke Rehabilitation with Trial Sequential Analysis”. *Healthcare*, 10(10):1984. [PMID: 36292431. DOI: 10.3390/healthcare10101984]
11. Kumar, N.\*, **Sidarta, A.\***, Smith, C., & Ostry, D. J. (2022). “Ventrolateral Prefrontal Cortex Contributes to Human Motor Learning”. *eNeuro* 9(5), ENEURO.0269-22.2022. [PMID: 36114001. DOI: 10.1523/ENEURO.0269-22.2022]
12. **Sidarta, A.**, Lim, Y.C., Wong, R.A., Tan, I.O., Kuah C.W.K., Ang, W.T. (2022). “Current clinical practice in managing somatosensory impairments and the use of technology in stroke rehabilitation”. *PLOS One* 17(8): e0270693. [PMID: 35951544. DOI: 10.1371/journal.pone.0270693]
13. Lei, Z., Tan, B.Y., Garg, N.P., Li, L., **Sidarta, A.**, & Ang, W.T. (2022). “An Intention Prediction Based Shared Control System for Point-to-Point Navigation of a Robotic Wheelchair”. *IEEE Robotics and Automation Letters*, 7(4), pp. 8893–8900. [ DOI: 10.1109/LRA.2022.3189151]
14. **Sidarta, A.**, Komar, J., & Ostry, D.J. (2022). “Clustering analysis of movement kinematics in reinforcement learning”. *Journal of Neurophysiology*, 127(2), 341–353. [PMID: 34936514. DOI: 10.1152/jn.00229.2021]
15. **Sidarta, A.**, Lim, Y.C., Kuah, C.W.K., Loh, Y.J., & Ang, W.T. (2021). “Robotic-based ACTIVE somatoSENSory (Act. Sens) retraining on upper limb functions with chronic stroke survivors: study protocol for a pilot randomised controlled trial”. *Pilot and Feasibility Studies*, 7(1), 1-11. [PMID: 34782024. DOI: 10.1186/s40814-021-00948-3]
16. Liang, P., Kwong, W.H., **Sidarta, A.**, Yap, C.K., Tan, W.K., et al. (2020). “An Asian-centric human movement database capturing activities of daily living”. *Scientific Data*, 7(1), 290. [PMID: 32901007. DOI: 10.1038/s41597-020-00627-7]
17. **Sidarta, A.**, VanVugt, F.T., Ostry, D.J. (2018) “Somatosensory working memory in reinforcement-based motor learning”. *Journal of Neurophysiology*. 120(6): 3275–3286. [PMID: 30354856. DOI: 10.1152/jn.00442.2018]

18. **Sidarta, A.**, Vahdat, S., Bernardi, N.F., Ostry, D.J. (2016). “Somatic and reinforcement-based plasticity in the initial stages of human motor learning”. *Journal of Neuroscience*. 36 (46): 11682-11692. [PMID: 27852776. DOI: 10.1523/JNEUROSCI.1767-16.2016]
  19. Latt, W.T., Tan, U.X., Georgiou, A., **Sidarta, AE.**, Riviere, C.N., & Ang, W.T. (2012). “A micro-motion sensing system for micromanipulation tasks”. *Sensors and Actuators A: Physical*, 173(1), 254-266. [PMID: 22423177. DOI: 10.1016/j.sna.2011.09.009]
- Submitted manuscript
    1. Wu, J. Y., Li J. Q., Kwong, P.W.H., Zhang J. J., **Sidarta, A.** “Neural Mechanisms underlying Bimanual Coordination in Healthy and Stroke Individuals and Application of Non-Invasive Brain Stimulation: A Scoping Review”. Under review in *Systematic Review*.
    2. Wu, J., Kwong, P. W. H., **Sidarta, A.**, Zhang, J. J., Zhuang, J., Li, Y., & Fong, K. N. (2024). Understanding Bilateral Motor Coordination in Stroke Using the Towel Folding Task: An Exploratory Biomechanical Study. Under review in *Human Movement Science*.
  - Published proceeding
    1. Jatesiktat, P., Anopas, D., Kwong, W. H., **Sidarta, A.**, Liang, P., & Ang, W. T. (2022, May). Muscle Activation Analysis from Gait Kinematics and Reinforcement Learning. In *2022 19th International Conference on Electrical Engineering/Electronics, Computer, Telecommunications and Information Technology (ECTI-CON)* (pp. 1-4). IEEE. [DOI: 10.1109/ECTI-CON54298.2022.9795606]
    2. Kwong, W.H, **Sidarta, A.**, Chua, S.G. Karen, Ang, W.T., Liang, P., Pataky, T., and Donnelly, C.J. (2020). “Recommendations for Minimum Trial Numbers During Walking Gait”, *ISBS Proceedings Archive*: Vol. 38: Iss. 1, Article 41.
    3. **Ananda, E.S.**, Latt, W.T., Shee, C.Y., Su, E.L., Burdet, E., ... (2009). “Influence of visual feedback and speed on micromanipulation accuracy”. In *Proc. 31st Intl. Conf. IEEE Engineering in Medicine and Biology Society* (pp. 1188 - 1191), Minneapolis, USA. [DOI: 10.1109/IEMBS.2009.5333996]
    4. Latt, W.T., **Ananda, E.S.**, Ong, S.C.L., Veluvolu, K.C., Shee, C.Y., & Ang, W.T. (2008). “Design and implementation of a two degree-of-freedom micromanipulation assessment system”. In *Proc. 30th Intl. Conf. IEEE Engineering in Medicine and Biology Society* (pp. 5640-5643), Vancouver, Canada.
  - Select conference abstract
    1. **Sidarta, A.**, Lim, Y. C., Gonzalez, P. C., Zhang, J.Q.J, Kwong, P.W.H. (2025). “Thinking while falling forward: an EEG study on reactive postural control in older adults”. Presented at the *RehabWeek 2025 – ACRM Fast Forward Presentation*, Chicago, IL, US.
    2. **Sidarta, A.**, et al. (2025). “Normative grip and pinch strengths in multi-ethnic Asian adults: a Singapore perspective”. Presented at the *RehabWeek 2025 – ACRM poster session*, Chicago, IL, US.
    3. Gonzalez, P.C, **Sidarta, A.**, Er, C., et al. (2024). “Comprehensive phenotyping and innovative granular assessment tools for advancing stroke rehabilitation”. Presented at the *8<sup>th</sup> Singapore Rehabilitation Conference (SRC)*, Singapore.
    4. **Sidarta, A.**, Lim, Y.C., Gonzalez, P.C., Omar, N.B., Er, J.K., Kwong, W.H.P., Ang, W.T. (2024), “Evidence of brain-evoked potentials from a forward trip on a sloped terrain in old adults”. Presented at *18th International Society of Physical and Rehabilitation Medicine (ISPRM)*, Sydney, NSW, Australia.
    5. **Sidarta, A.**, Lim, Y.C., Kuah, C.W.K., Loh, Y.J., Ang, W.T. (2023). “Robot-assisted Active Somatosensory Retraining of Upper Limb Stroke - a Preliminary Finding”. Presented at the *RehabWeek 2023 – ACRM Fast Forward Presentation*, Singapore.
    6. **Sidarta, A.**, Lim, Y.C., Er, J. K., Er, C., Lim, L.S., Kwong, P.W.H., Ang, W.T. (2023). “Neuromuscular signals of postural imbalance in older adults”. Presented at the *Neural Control of Movement* annual meeting, Victoria, BC, Canada.
    7. Kumar, N., **Sidarta, A.**, Ostry, D.J., Thiel, A. (2023). "Early robot-assisted proprioceptive training for arm reaching in acute stroke". Presented at the *9th European Stroke Organization Conference – ESOC 2023*, Munich, Germany.

8. Lim, Y.C., Wong, R.A., Tan, I.O., Kuah, C.W.K., **Sidarta, A.** (2022). “Managing somatosensory impairments in stroke: Current clinical practice and the use of technology”. Presented at the *American Congress of Rehabilitation Medicine* (ACRM) annual conference, Chicago, IL, USA.
  9. **Sidarta, A.**, Kumar, N., Manning, T.F., Ostry, D.J. (2018). “Suppression of lateral prefrontal cortex impairs somatosensory working memory”. Presented at the *Society for Neuroscience* annual meeting, San Diego, CA, USA.
  10. Kumar, N., Manning, T.F., **Sidarta, A.**, Ostry, D.J. (2018). “Somatosensory but not Primary Motor Cortex is involved in the consolidation of Motor Memory”. Presented at the *Society for Neuroscience* annual meeting, San Diego, CA, USA.
  11. Thiel, A., Vahdat, S., Darainy, M., Ostry, D.J., **Sidarta, A.** (2018). "Robot assisted proprioceptive training for improving motor function after stroke". Abstract compiled in the *Cerebrovascular Diseases*, 45, 41-41.
  12. **Sidarta, A.**, Bergeron, K., VanVugt, F.T., Ostry, D.J. (2018). “The relationship between somatosensory working memory and human motor learning”. Presented at the *Neural Control of Movement* annual meeting, Sante Fe, NM, USA.
  13. **Sidarta, A.**, Vahdat, S., Bernardi, N.F., Ostry, D.J. (2016). “The incentive of success: Plasticity in the initial stages of motor learning”. Presented at the *1st NeuroSymposium Quebec 2016*, Montreal, QC, Canada.
- Talks and presentations
    1. “Fall Prevention and Ageing”. Sharing session at Sembawang Central Zone-1 Residents’ Network, Singapore, May 2024.
    2. “Ability Data: Large movement database in the context of rehabilitation”. Special workshop session for the *i-CREAtE 2023*, Bangkok, Thailand, August 2023.
    3. “Functional networks associated with the initial stages of motor learning”, CRBLM Data Blitz, Montreal, Canada, April 2016.

## INTELLECTUAL PROPERTIES

Study name	Region	Application #	Registration date
1. Motion motor test system	US	US 18553149	2022-04-19
2. Methods and systems for shared control of goal directed wheelchair navigation	WIPO (PCT)	WO 2022216232A1	2022-04-06
3. Motion motor test system	WIPO (PCT)	WO 2022225454A1	2022-04-19
4. Table motion motor test system	WIPO (PCT)	WO 2022225452A1	2022-04-19

## INDUSTRIAL EXPERIENCES

I spent 6 years working as an engineer in the corporate world before my PhD. From 2011 to 2012, I joined *Life Technologies* (now *Thermo Fisher Scientific*) and was responsible for the design & development of a new software package to test PCR machines using National Instruments’ LabVIEW. Other work history includes a short stint as a co-founder and Assistant Director of an engineering startup (*SISTECH Pte. Ltd.*) in 2010, focusing on developing automated electronic test solutions, involving hardware & software integration using LabVIEW.