

Dr. Ananda Sidarta

Senior Research Scientist
Rehabilitation Research Institute of Singapore
📍 11 Mandalay Road #14-03,
Clinical Sciences Building, LKC Medicine
Nanyang Technological University

✉ Email: ananda.sidarta@gmail.com
<https://asidarta.wixsite.com/resume>
ORCID: 0000-0002-2325-3137
 <https://www.linkedin.com/in/asidarta>
Residential status: Singapore PR

EDUCATION

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

RESEARCH INTERESTS

Movement is a fundamental human need, regardless of age. Whether the movement involves reaching and grasping or ambulation, the central nervous system must make precise plans and controls. I am interested in quantifying and enhancing human performance in relation to the sensorimotor system and brain health using modern technology, with a special interest in neurorehabilitation and skill learning.

RESEARCH GRANTS

- | | |
|---|-------------|
| 1. <i>Act.Sens - active sensorimotor training for chronic stroke survivors</i>
Early Career Research Fellowship Program, RFP (S\$ 237,500)
Funder: A*STAR/NHG/NTU, Rehabilitation Research Grant Call
Role: Principal Investigator | 2019 - 2023 |
| 2. <i>Deep phenotyping of upper limb sensorimotor recovery in Asian stroke survivors</i>
Future Health Technologies, Module 3 (S\$ 1,59mil)
Funder: CREATE Programme, National Research Foundation
Role: Scientific lead (PI: Dr Nicole Wenderoth, Dr Karen Chua, Dr Ang Wei Tech) | 2023 - 2026 |
| 3. <i>H-Stride: a robotics-assisted solution for rehabilitation of the lower extremities</i>
NRP 2.0 Funding Initiative, MTC (S\$ 974,900)
Funder: National Robotics Programme, NRP
Role: Co-Investigator (PI: Dr Domenico Campolo) | 2026 - 2027 |

AWARDS & SCHOLARSHIPS

- | | |
|---|------|
| 1. Best Poster Award – Basic Science/Translational
Source: Singapore Biomedical & Health Congress (SHBC) 2025, Singapore | 2025 |
| 2. Meeting Support Award to NCM 2023, Canada
Source: Society for the Neural Control of Movement | 2023 |
| 3. Teaching Assistant Award
Source: Department of Psychology, McGill University | 2018 |

- | | |
|--|-------------|
| 4. Returning Student Fellowship (CAD 10,000)
Source: Interdisciplinary Program in Neuroscience, McGill University | 2016 |
| 5. Research Mobility Award to Seattle, USA
Source: Department of Psychology, McGill University | 2013 |
| 6. Graduate Excellence Scholarship in Neurology & Neurosurgery
Source: Interdisciplinary Program in Neuroscience, McGill University | 2012 - 2015 |
| 7. Molson & Hilton Hart Fellowship (CAD 8,500)
Source: Faculty of Science, McGill University | 2012 |
| 8. Certificate of Excellence in Biomedical Engineering
Source: Graduate School, Nanyang Technological University | 2009 |

ACADEMIC SERVICES

- | | |
|--|-------------|
| 1. Undergraduate mentorship | 2020 - now |
| <ul style="list-style-type: none"> LKC Medicine: Russell Wong (2021), Wong Q.H.^ (2022), Sng Q.W. (2022), Daniel J. (2023), G. Barath (2023), Isaac Kuah (2023), Jonathan Foo (2025), Kong P. Y. (2025). ^ : 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 |
| <ul style="list-style-type: none"> <i>PLOS One</i> <i>Journal of NeuroEngineering and Rehabilitation</i> <i>Pilot & Feasibility Studies</i> <i>Experimental Brain Research</i> <i>npj Science of Learning</i> <i>IEEE ICORR</i> <i>Brain Sciences</i> | |
| 3. Teaching Assistantship (TA), Department of Psychology, McGill University | 2012 - 2017 |
| <ul style="list-style-type: none"> Introduction to Statistics Sensorimotor Behavior Sensory Perception Statistics for Experimental Design Intro. to Behavioral Neuroscience <p>Guest lecturer for "Introduction to Statistics" in the same department (Summer, 2018)</p> | |
| 4. Scientific international membership | |
| 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

PUBLICATIONS

- Peer-reviewed articles (* denotes equal contribution)
1. Kaliya-Perumal AK, **Sidarta A**. Healthcare reimagined: Carebots from hospital to home. *Public Health*. 2025; 248:105920. [PMID: 40834625 DOI: 10.1016/j.puhe.2025.105920]
 2. Zhong L, Wu J, Li J, **Sidarta A**, Zhang JJ, Kwong PWH. Distinct hip–knee coordination patterns in individuals with hip osteoarthritis as measured by cyclograms. *Gait & Posture*. 2025; 121:217–24. [PMID:40482569. DOI:10.1016/j.gaitpost.2025.06.004]
 3. Tay MRJ, Kim JM, Ong PL, Khin LW, Wong CJ, Kong KH, ..., **Sidarta A**, et al. Targeting osteosarcopenia and multimorbidity for frailty prevention through identification and deep phenotyping methods in healthy ageing and high-burden disease cohorts (OPTIMA-C): a longitudinal observational cohort study protocol for neuromusculoskeletal muscle health. *BMJ Open*. 2025;15(5):e094279. [DOI: 10.1136/bmjopen-2024-094279]
 4. **Sidarta A**, Soh LJ, Lie E, Kwong PWH, Yeh IL, Liang P, Ang WT. Establishing normative pinch and grip strengths across adult age groups in Singapore. *BMC Sports Sci Med Rehabil*. 2025;17(1):84. [PMID: 40229663. DOI: 10.1186/s13102-025-01140-3]
 5. **Sidarta A**, Lim YC, Kuah CWK, Chua KSG, Ang WT. Relearning upper limb proprioception after stroke through robotic therapy: a feasibility analysis. *J Clin Med*. 2025;14(7):2189. [PMID: 40217638. DOI: 10.3390/jcm14072189]
 6. Zhang L, **Sidarta A**, Wu TL, Jatesiktat P, Ang WT. Towards clinical application of enhanced Timed Up and Go with markerless motion capture and machine learning for balance and gait assessment. *IEEE J Biomed Health Inform*. [DOI: 10.1109/JBHI. 2025.3543095]
 7. Li J, Kwong PW, Lin W, Fong KN, Wu W, **Sidarta A**. Assessment of ambulation functions through kinematic analysis in individuals with stroke: a systematic review. *Eur J Phys Rehabil Med*. 2025;61(1):28–40. [PMID: 40008910. DOI: 10.23736/S1973-9087.25.08767-2]
 8. Premchand B, Zhang Z, Ang KK, Yu J, Tan IO, **Sidarta A**, et al. A personalized multimodal BCI–soft robotics system for rehabilitating upper limb function in chronic stroke patients. *Biomimetics (Basel)*. 2025;10(2):94. [PMID: 39997117. DOI: doi.org/10.3390/biomimetics 10020094]
 9. Soh LJ, Lim LS, Law WC, Lau JL, Lie E, Yeh IL, ... **Sidarta A**, et al. Technical properties of a sensor-aided key rig for hand function measurement: a proof-of-concept study. *IEEE Sensor J*. 2024;25(1):260–5 [DOI: 10.1109/JSEN.2024.3494814.]
 10. Kwong WH, Li JQ, Lui CH, Luk HT, Lau KF, Seaby R, **Sidarta A**. 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*. 2024;9:161. [PMID: 39311269. DOI: 10.3390/jfmk9030161]
 11. Pan JW, **Sidarta A**, Wu TL, Kwong WPH, Ong PL, Tay MRJ, et al. Unraveling stroke gait deviations with movement analytics, more than meets the eye: a case–control study. *Front Neurosci*. 2024;18:1425183. [PMID: 39104608. DOI: 10.3389/fnins.2024.1425183]
 12. Cheng HJ, Chin LF, Kanzler CM, Lehner R, Kuah CW, Kager S, ... , **Sidarta A**, et al. Upper limb sensorimotor recovery in Asian stroke survivors: a study protocol for the development and implementation of a Technology-Assisted digital biOmaRker (TAILOR) platform. *Front Neurol*. 2023; 14:1246888. [PMID: 38107648. DOI: 10.3389/fneur.2023.1246888]
 13. Li JQ, Sun YW, So WS, **Sidarta A**, Kwong PWH. A comprehensive appraisal of meta-analyses of exercise-based stroke rehabilitation with trial sequential analysis. *Healthcare (Basel)*. 2022;10(10):1984. [PMID: 36292431. DOI: 10.3390/healthcare10101984]

14. Kumar N*, **Sidarta A***, Smith C, Ostry DJ. Ventrolateral prefrontal cortex contributes to human motor learning. *eNeuro*. 2022;9(5):ENEURO.0269-22.2022. [PMID: 36114001. DOI: 10.1523/ ENEURO.0269-22.2022]
 15. **Sidarta A**, Lim YC, Wong RA, Tan IO, Kuah CWK, Ang WT. Current clinical practice in managing somatosensory impairments and the use of technology in stroke rehabilitation. *PLoS One*. 2022;17(8):e0270693. [PMID: 35951544. DOI: 10.1371/journal.pone.0270693]
 16. Lei Z, Tan BY, Garg NP, Li L, **Sidarta A**, Ang WT. An intention-prediction-based shared control system for point-to-point navigation of a robotic wheelchair. *IEEE Robot Autom Lett*. 2022;7(4):8893–900. [DOI: 10.1109/LRA.2022.3189151]
 17. **Sidarta A**, Komar J, Ostry DJ. Clustering analysis of movement kinematics in reinforcement learning. *J Neurophysiol*. 2022;127(2):341–53. [PMID: 34936514. DOI: 10.1152/jn.00229.2021]
 18. **Sidarta A**, Lim YC, Kuah CWK, Loh YJ, Ang WT. Robotic-based ACTive somatoSENSory (Act.Sens) retraining on upper limb functions with chronic stroke survivors: study protocol for a pilot randomized controlled trial. *Pilot Feasibility Stud*. 2021;7(1):1–11. [PMID: 34782024. DOI: 10.1186/s40814-021-00948-3]
 19. Liang P, Kwong WH, **Sidarta A**, Yap CK, Tan WK, et al. An Asian-centric human movement database capturing activities of daily living. *Sci Data*. 2020;7(1):290. [PMID: 32901007. DOI: 10.1038/s41597-020-00627-7]
 20. **Sidarta A**, VanVugt FT, Ostry DJ. Somatosensory working memory in reinforcement-based motor learning. *J Neurophysiol*. 2018;120(6):3275–86. [PMID: 30354856. DOI: 10.1152/jn.00442.2018]
 21. **Sidarta A**, Vahdat S, Bernardi NF, Ostry DJ. Somatic and reinforcement-based plasticity in the initial stages of human motor learning. *J Neurosci*. 2016;36(46):11682–92. [PMID: 27852776. DOI: 10.1523/JNEUROSCI.1767-16.2016]
 22. Latt WT, Tan UX, Georgiou A, **Sidarta AE**, Riviere CN, Ang WT. A micro-motion sensing system for micromanipulation tasks. *Sens Actuators A Phys*. 2012;173(1):254–66. [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. “Understanding Bilateral Motor Coordination in Stroke Using the Towel Folding Task: An Exploratory Biomechanical Study”. Under review in *Human Movement Science*.
 3. Cruz Gonzalez, Pablo; ZHANG, Jack Jiaqi; **Sidarta, Ananda**; Chua, Karen Sui Geok. “To Treat or Not to Treat? Reflections on the Clinical Translation of Non-invasive Neuromodulation Therapy for Post-Stroke Upper Limb Recovery”. Under review in *Neurorehabilitation and Neural Repair*.
 4. **Sidarta, A.**, Lim Y. C., Gonzalez P. C, Zhang J. J, Kwong, P.W.H, Chua, K.S.G. “Mind the Slope: Evoked Cortical Signatures of Balance Recovery on Inclined Surfaces”. Under review in *Scientific Reports*.
 - Conference proceedings
 1. Zhang L, **Sidarta A**, Lim YC, Er C, Yan X, Wu TL, Ang WT. Muscle activation and postural sway in response to task complexity: a study of balance control in older adults. In: *Proc IEEE Int Conf Rehabil Robot (ICORR)*. 2025. p. 82–7. Chicago, IL, USA.. [DOI: 10.1109/ICORR66766.2025.11063123]

2. Jatesiktat P, Anopas D, Kwong WH, **Sidarta A**, Liang P, Ang WT. Muscle activation analysis from gait kinematics and reinforcement learning. In: *Proc 19th Int Conf Electr Eng/Electronics, Comput, Telecommun Inf Technol (ECTI-CON)*. [DOI: 10.1109/ECTI-CON54298.2022.9795606]
3. Kwong WH, Sidarta A, Chua SGK, Ang WT, Liang P, Pataky T, Donnelly CJ. Recommendations for minimum trial numbers during walking gait. *ISBS Proc Arch*. 2020;38(1):41.
4. **Ananda ES**, Latt WT, Shee CY, Su EL, Burdet E, et al. Influence of visual feedback and speed on micromanipulation accuracy. In: *Proc 31st Annu Int Conf IEEE Eng Med Biol Soc (EMBC)*. 2009. p. 1188–91. Minneapolis, USA. doi: 10.1109/IEMBS.2009.5333996. [DOI: 10.1109/IEMBS.2009.5333996]
5. Latt WT, **Ananda ES**, Ong SCL, Veluvolu KC, Shee CY, Ang WT. Design and implementation of a two degree-of-freedom micromanipulation assessment system. In: *Proc 30th Annu Int Conf IEEE Eng Med Biol Soc (EMBC)*. 2008. p. 5640–3. Vancouver, Canada.

- Select conference abstracts

1. Chan LG, Lin J, Mohapatra L, **Sidarta A**. Neuroimaging correlates of outcomes of poor sleep after acquired brain injury. Presented at: *World Sleep Congress 2025*; 2025; Singapore.
2. **Sidarta A**, Lim YC, Gonzalez PC, Zhang JQJ, Kwong PWH. Thinking while falling forward: an EEG study on reactive postural control in older adults. Presented at: *RehabWeek 2025 – ACRM Fast Forward Presentation*; 2025; Chicago, IL, USA.
3. Choo AXY, Kwong PWH, Li JQ, **Sidarta A**, Dai BT. Sub-phases detection in gait cycles using deep learning and marker coordinate data. Presented at: *Int Conf Movement Sci Technol (ICMST)*; 2024; Taipei, Taiwan.
4. Gonzalez PC, **Sidarta A**, Er C, et al. Comprehensive phenotyping and innovative granular assessment tools for advancing stroke rehabilitation. Presented at: *8th Singapore Rehabilitation Conference (SRC)*; 2024; Singapore.
5. **Sidarta A**, Lim YC, Gonzalez PC, Omar NB, Er JK, Kwong WHP, Ang WT. Evidence of brain-evoked potentials from a forward trip on a sloped terrain in old adults. Presented at: *18th Int Soc Phys Rehabil Med (ISPRM)*; 2024; Sydney, NSW, Australia.
6. **Sidarta A**, Lim YC, Kuah CWK, Loh YJ, Ang WT. Robot-assisted active somatosensory retraining of upper limb stroke – a preliminary finding. Presented at: *RehabWeek 2023 – ACRM Fast Forward Presentation*; 2023; Singapore.
7. **Sidarta A**, Lim YC, Er JK, Er C, Lim LS, Kwong PWH, Ang WT. Neuromuscular signals of postural imbalance in older adults. Presented at: *Neural Control of Movement (NCM) Annual Meeting*; 2023; Victoria, BC, Canada.
8. Kumar N, **Sidarta A**, Ostry DJ, Thiel A. Early robot-assisted proprioceptive training for arm reaching in acute stroke. Presented at: *9th European Stroke Organization Conference (ESOC)*; 2023; Munich, Germany.
9. Lim YC, Wong RA, Tan IO, Kuah CWK, **Sidarta A**. Managing somatosensory impairments in stroke: current clinical practice and the use of technology. Presented at: *American Congress of Rehabilitation Medicine (ACRM) Annual Conference*; 2022; Chicago, IL, USA.
10. **Sidarta A**, Kumar N, Manning TF, Ostry DJ. Suppression of lateral prefrontal cortex impairs somatosensory working memory. Presented at: *Society for Neuroscience (SfN) Annual Meeting*; 2018; San Diego, CA, USA.
11. Kumar N, Manning TF, **Sidarta A**, Ostry DJ. Somatosensory but not primary motor cortex is involved in the consolidation of motor memory. Presented at: *Society for Neuroscience (SfN) Annual Meeting*; 2018; San Diego, CA, USA.
12. Thiel A, Vahdat S, Darainy M, Ostry DJ, **Sidarta A**. Robot-assisted proprioceptive training for improving motor function after stroke. *Cerebrovasc Dis*. 2018;45:41.

13. **Sidarta A**, Bergeron K, VanVugt FT, Ostry DJ. The relationship between somatosensory working memory and human motor learning. Presented at: *Neural Control of Movement (NCM) Annual Meeting*; 2018; Santa Fe, NM, USA.
14. **Sidarta A**, Vahdat S, Bernardi NF, Ostry DJ. The incentive of success: plasticity in the initial stages of motor learning. Presented at: *1st NeuroSymposium Québec*; 2016; Montreal, QC, Canada.

- Talks and presentations

1. “The non-movement side of precision rehabilitation”. Invited talk for the Future Healthcare track, 3rd Annual Biomechanics Day, SGH-Academia, Singapore, October 2025.
2. “Smartwatch for smarter health”. Sharing session at Sembawang Central Zone-1 Residents’ Network, Singapore, July 2025.
3. “Fall Prevention and Ageing”. Sharing session at Sembawang Central Zone-1 Residents’ Network, Singapore, May 2024.
4. “Ability Data: Large movement database in the context of rehabilitation”. Special workshop session for the *i-CREATE* 2023, Bangkok, Thailand, August 2023.
5. “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

CORPORATE PORTFOLIO

Before pursuing my PhD, I spent six years as an engineer in the corporate sector, where I honed my management and leadership skills. From 2011 to 2012, I was with *Life Technologies* (now *Thermo Fisher Scientific*) and was responsible for designing and developing 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.