REPORTS AND REVIEWS/POROČILA IN OCENE, 81–86

NEUROSCIENCE OF MOVEMENT – EXPLORING THE DYNAMICS OF THE HUMAN BRAIN IN MOTION

TwinBrain Summer School 3.0,
Piran, Slovenia 19–24 June 2023

Our daily lives are filled with automatic actions, and although we often respond effortlessly, our brains are engaged in numerous intricate processes. It is only when we (re)learn certain cognitive-motor tasks, such as maintaining balance while skiing or surfing, or even grasping a spoon after a stroke, that we realize the true difficulty involved. Conversely, we are aware of various progressive neurodegenerative diseases that hinder the smooth execution of everyday tasks. The study of brain dynamics during routine movements, such as walking, balancing or acquiring new motor-cognitive skills, poses a significant challenge for neuroscience.

The TwinBrain Summer School 3.0 hosted an international team of experts who shared the latest neuroscience discoveries in movement-related topics and explored how brain imaging technology contributes to understanding brain function and disease development. Advancements in wireless and portable technologies have extended experimentation into real-life scenarios, reflecting everyday experiences. The distinguished experts from Slovenia, Germany, Belgium, Italy, Luxembourg, the Netherlands, France, Switzerland and the USA presented cutting-edge developments in Mobile Brain/Body Imaging (MoBI).

Professor Dr Nico Bohnen, MD, a renowned radiology and neurology expert from the University of Michigan, delivered the keynote speech for this year's summer school. With a dedicated career focused on Parkinson's disease research and treatment, which affects over 8.5 million people worldwide, Prof. Dr Bohnen strives to discover innovative approaches that enhance the independence and quality life of individuals with Parkinson's disease and the elderly population. His lecture, held on Tuesday, 20 June 2023, at the town hall of the Municipality of Piran, revolved around the neurobiological basis of walking and balance problems in Parkinson's disease. Utilizing positron emission tomography (PET) to explore metabolic and biochemical brain processes, he presented the mechanisms underlying the disease's development and progression, along with novel treatment approaches for more effective and holistic patient care.

The final instalment of the TwinBrain Summer School series, known as TwinBrain Summer School 3.0, was held in Piran, Slovenia, from 19–24 June 2023. This event was the culmination of the TwinBrain H2020 project:

TwinBrain – TWINning the BRAIN with machine learning for neuro-muscular efficiency

European Commission: HORIZON 2020. WIDESPREAD-05-2020 – Twinning

Grant agreement ID: 952401

The Community Research and Development Information Service (CORDIS): https://cordis.europa.eu/project/id/952401

TwinBrain partner institutions: Znanstveno-raziskovalno središče Koper (Slovenia), Technische Universität Berlin (Germany), Université de Genève (Switzerland), Università degli Studi di Trieste (Italy)

Principal Investigator: Uroš Marušič, PhD

Project duration: 1 November 2020 – 31 October 2023

Overall budget: €900k

Uroš Marušič, Tisa Hodnik, Manca Peskar

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Poletna šola TwinBrain 3.0,
Piran, Slovenija, 19.–24. junij 2023

Naš vsakdan je napolnjen z avtomatiziranimi dejanji, in čeprav se nanje pogosto odzovemo, ne da bi ob tem občutili napor, so naši možgani neprestano vpeti v številne zapletene procese. Šele ko se (ponovno) naučimo določenih kognitivno-motoričnih nalog, kot je ohranjanje ravnotežja med smučanjem ali surfanjem ali držanje žlice po možganski kapi, spoznamo resnično zahtevnost izvajanja takih nalog. Kljub temu se zavedamo, da številne progresivne nevrodegenerativne bolezni neprestano ovirajo nemoteno opravljanje vsakdanjih nalog. Raziskovanje možganskega delovanja med rutinskimi opravili, kot so hoja, ohranjanje ravnotežja in pridobivanje novih kognitivno-motoričnih veščin, je pomemben izziv za nevroznanost.

Poletna šola TwinBrain 3.0 je gostila mednarodno ekipo strokovnjakov, ki je delila najnovejša odkritja s področja nevroznanosti s poudarkom na temah, povezanih z gibanjem, ter raziskovala, kako tehnologija slikanja možganov prispeva k razumevanju delovanja teh in razvoju bolezni. Napredki v brezžični in prenosni tehnologi so omogočili eksperimentiranje v dejanskih okoliščinah, ki izražajo vsakodnevne izkušnje. Izjemni strokovnjaki iz Slovenije, Nemčije, Belgije, Italije, Luksemburga, Nizozemske, Francije, Švice in ZDA so predstavili najnovejše dosežke na področju mobilnega slikanja možganov in telesa (Mobile Brain/Body Imaging – MoBI).

Slavnostni govornik letošnje poletne šole je bil profesor dr. Nico Bohnen, dr. med., priznan strokovnjak za radiologijo in nevrologijo z univerze v Michiganu. V svoji dolgoletni karieri se predano posveča raziskovanju in zdravljenju Parkinsonove bolezni, ki prizadene več kot 8,5 milijona ljudi po vsem svetu. Prizadeva si odkriti inovativne pristope, ki izboljšujejo neodvisnost in kakovost življenja posameznikov s Parkinsonovo boleznijo in starejše populacije. Njegovo predavanje, ki je potekalo v torek, 20. junija 2023, v mestni hiši Občine Piran, je osvetljevalo nevrobiološke osnove težav pri hoji in ravnotežju pri Parkinsonovi bolezni. Predstavljene mehanizme, ki sovpadajo z razvojem in napredovanjem bolezni, ter nove pristope k zdravljenju za bolj učinkovito in celostno oskrbo pacientov odkriva s pomočjo pozitronske emisijske tomografije (PET).

Tretja in zadnja izmed poletnih šol TwinBrain, znana kot TwinBrain Summer School 3.0, je potekala v Piranu v Sloveniji med 19. in 24. junijem 2023. Ta dogodek je bil vrhunec projekta TwinBrain H2020:

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