

## SLOVENIAN MOBILE BRAIN/BODY IMAGING LABORATORY (SloMoBIL)

On 8 July 2021, the Institute for Kinesiology Research of the Science and Research Centre Koper (ZRS Koper) acquired a new laboratory. Slovenian Brain/Body Imaging Laboratory (SloMoBIL), is equipped with the latest technology for investigating neuromuscular efficiency, which will significantly help in conducting research aimed at in-depth understanding of our brains during movement. SloMoBIL laboratory is one of the few laboratories in the world to use such technology and approaches to investigate brain processes during movement and in connection with the movement information yielded. A comprehensive understanding of the brain dynamics associated with real-life in non-static conditions, will provide insight into the complex processes of embodied cognition.

The establishment of the SloMoBIL laboratory represents one of the key milestones of the international project “TwinBrain: TWINning the BRAIN with machine learning for neuro-muscular efficiency (ID 952401),” which will be implemented between 2020 and 2023. In addition to ZRS Koper, the lead partner of the TwinBrain project, the consortium consists of the Technical University Berlin (Technische Universität Berlin), the University of Geneva (Université de Genève) and the neurology department of the Cattinara Hospital in Trieste (Università degli Studi di Trieste). As a key element of the partnerships, the members of SloMoBIL made the first transfer of knowledge at



the Technical University of Berlin, and in the future, a visit to Geneva and a study on Parkinson's patients in Trieste are also expected.

At the opening ceremony speeches were delivered by prof. dr. **Rado Pišot**, director of ZRS Koper, prof. dr. **Boštjan Šimunič**, Head of the Institute for Kinesiology Research ZRS Koper, Assoc. prof. dr. **Uroš Marušič**, head and principal investigator of the TwinBrain project, prof. dr. **Klaus Gramann**, TwinBrain project partner, and keynote speaker, prof. dr. **Jadran Lenarčič**.

Accompanied by musician David Kocmur, dancer Urša Rupnik presented part of the newly acquired equipment of the SloMoBIL, the Full Body Kinematics, which detects body movements via high-frequency cameras and inertial sensors positioned around the limbs, torso, and head, and projects the dancer's avatar in real time on the screen.

After the ceremony, SloMoBIL Laboratory opened its doors. Within, the working groups prepared interactive presentations of electroencephalography (EEG) and its application in the field of neurofeedback, the use of virtual environments (VR) for rehabilitation after unilateral upper limb injury, and investigation of motor unit activation by electromyography (EMG) on the example of balance training.

The tour of the laboratory was followed by socializing and refreshments.

In addition to the above-mentioned people, we would like to thank Maja Maša Šömen, Daša Gorjan, Nina Omejc, Luka Šlosar, Miloš Kalc, Aleksandar Miladinović, Teja Ličen, Nika Štravs and the entire ZRS Koper team, as well as Matej Sukič, David Nik Lipovac and Draško Golubar.

The video of the opening ceremony is available at the following link:

<https://www.regionalobala.si/novica/spremljali-smo-v-zivo-otvoritev-novega-laboratorija-slomobil-video>.

Uroš Marušič and Manca Peskar

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8. julija 2021 je Inštitut za kineziološke raziskave Znanstveno-raziskovalnega središča Koper (ZRS Koper) pridobil nov laboratorij. SloMoBIL, akronim za Slovenian Brain/Body Imaging Laboratory, je opremljen z najnovejšo tehnologijo za raziskovanje živčno-mišične učinkovitosti, ki bo pomembno pripomogla k izvajanju raziskav za poglobljeno razumevanje naših možganov med gibanjem. Laboratorij SloMoBIL je eden redkih laboratorijev na svetu, ki uporablja tako tehnologijo in pristope za raziskovanje možganskih procesov med gibanjem in v povezavi z gibalnimi informacijami. Približevanje oz. posnemanje okoliščin iz resničnega življenja omogoča celovito razumevanje možganske dinamike v nestatičnih pogojih in daje vpogled v kompleksne procese utelešene kognicije.

Vzpostavitev laboratorija SloMoBIL je eden glavnih mejnikov mednarodnega projekta TwinBrain: TWINning the BRAIN with machine learning for neuro-muscular efficiency (ID 952401), ki se izvaja med letoma 2020 in 2023. Ob ZRS Koper so projektni partnerji še Tehniška univerza v Berlinu (Technische Universität Berlin), Univerza v Ženevi (Université de Genève) in nevrološki oddelek bolnišnice Katinara v Trstu (Università degli Studi di Trieste). V sklopu partnerstev so člani SloMoBIL-a opravili prvi prenos znanja na Tehniški univerzi v Berlinu, v prihodnosti pa se obeta tudi obisk v Ženevi in izvedba raziskave na bolnikih s Parkinsonovo boleznijo v Trstu.



Na slavnostni otvoritvi so sodelovali **prof. dr. Rado Pišot**, direktor ZRS Koper, **prof. dr. Boštjan Šimunič**, predstojnik Inštituta za kineziološke raziskave ZRS Koper, **izr. prof. dr. Uroš Marušič**, vodja projekta TwinBrain, **prof. dr. Klaus Gramann**, partner projekta TwinBrain, in slavnostni govorec **prof. dr. Jadran Lenarčič**.

Na otvoritvi je plesalka Urša Rupnik ob glasbeni spremljavi Davida Kocmurja predstavila del novopridobljene opreme SloMoBIL-a, natančneje Full Body Kinematics, ki z visokofrekvenčnimi kamerami ter inercialnimi senzorji okoli okončin, trupa in glave zaznava premike telesa in v realnem času projicira na zaslon plesalkin avatar.

Po slavnostni otvoritvi je laboratorij SloMoBIL odprl svoja vrata. V njem so delovne skupine pripravile interaktivne predstavitve elektroencefalografije (EEG) na primeru nevrofeedbacka, uporabe virtualnih okolij (VR) za rehabilitacijo po unilateralni poškodbi zgornje okončine in raziskovanje aktivacije motoričnih enot z elektromiografijo (EMG) na primeru treninga ravnotežja.

Po ogledu laboratorija sta sledila druženje in pogostitev.

Za izvedbo dogodka se ob zgoraj omenjenih osebah zahvaljujemo še Maji Maši Šömen, Daši Gorjan, Nini Omejc, Luki Šlosarju, Milošu Kalcu, Aleksandru Miladinoviću, Teji Ličen, Niki Štravs in celotni ekipi ZRS Koper ter Mateju Sukiču, Davidu Niku Lipovacu in Drašku Golubarju.

Videosnetek z otvoritve je dostopen na spletni povezavi

<https://www.regionalobala.si/novica/spremljali-smo-v-zivo-otvoritev-novega-laboratorija-slomobil-video>.

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