

JACOPO RIGOSA

Nationality: Italian
Birth: August 24th, 1983
Gender: Male

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Phone: (+39) 349-4632488

EXPERIENCE

Postdoctoral Research Assistant | International School for Advanced Studies
2014–17 (Supervisor Prof. Mathew Diamond)

- ▶ Automatic whiskers tracking using high speed videography on behaving rats
- ▶ Whisker mechanical dynamics characterization to estimate the force transduction at the follicle level

Postdoctoral Research Assistant | École polytechnique fédérale de Lausanne
2013–14 (Supervisors Prof. Silvestro Micera and Prof. Gregoire Courtine)

- ▶ Extraction of cortical voluntary drives for neuro-control applications on behaving rats
- ▶ Closed-loop force control through intra-neural stimulation on anesthetized rats
- ▶ Electrophysiology and kinematics tracking on behaving rats
- ▶ Teaching assistant for undergraduate courses

Postdoctoral Research Assistant | Sant'Anna School of Advanced Studies
2010–14 (Supervisor Prof. Silvestro Micera)

- ▶ Extraction of cortical information related to locomotion on behaving rats
- ▶ Control for a prosthetic device for amputee subject based on neuro-muscular signals
- ▶ Electrical stimulation protocol to restore the natural sensory feedback on amputee subject
- ▶ Tutoring activity of master students of Biomedical Engineering

Visiting researcher | Institute of Neuroinformatics (ETHZ) and German Primate Center (Göttingen)
2009–10 (Supervisor Prof. Hansjörg Scherberger)

- ▶ Control of robotic arm and hand for a grasping setup for behaving monkeys
- ▶ Extraction of cortical information related to grasping on behaving monkeys

EDUCATION AND LICENSING

2010 | Sant'Anna School of Advanced Studies
Ph.D. in Neuroengineering
(summa cum laude)

2014 | RESAL University of Lausanne
FELASA recognized animal experimentation licence
(Module 1 course on laboratory rodents)

2006 | University of Pisa
M.Eng. in Biomedical Engineering
(summa cum laude and excellence award)

2007 | University of Pisa
Italian Professional licence for Industrial Engineering

2004 | University of Pisa
B.Eng. in Biomedical Engineering
(summa cum laude)

AWARDS

- 2014 | Finalist of the "Da Vinci Awards"
Paper: "Restoring natural sensory feedback in real-time bidirectional hand prostheses"
Category: Accessibility and Universal Design in the section Prosthetics/Orthotics/Controls
- 2010 | Selected for ESA "Spin Your Thesis!" with the HyperMuscle team
- 2008 | Finalist of ESA "Lunar Robotic Challenge" with the pESApod team
- 2007 | Three years Ph.D. scholarship at the Sant'Anna School of Advanced Studies

BEHAVIORAL COMPETENCIES

Excellent coordination and time management skills

Excellent communication and assessment abilities

Project planning and team leading

SKILLS

Languages: Italian (mother tongue), English (fluent)

Operating systems: Microsoft Windows, Linux

Information skills: Coding, Machine Learning, Digital Signal Processing, Control System, Statistical Computing

Coding proficiency: C, C++, Matlab/Octave, Python, Labview, Processing (Arduino), Git

Coding familiarity with: R, Java, Bash, SQL, ImageJ

Electronic design: PSpice, KiCad

Editing: Office, L^AT_EX, Gimp, InkScape

Car and Sailboat Licence

RESEARCH PROJECTS PARTICIPATION

Funded by European Union:

WAY (FP7-ICT #288551) Wearable interfaces for hAnd function recoverY

NEUWalk (FP7-ICT #258654) Neuroprosthetic interface systems for restoring motor functions

TIME (FP7-ICT #224012) Transverse, Intrafascicular Multichannel Electrode to induce sensation and treat phantom limb pain

NEUROBOTICS (FP6-IST #001917) The fusion of neuroscience and robotics for augmenting human capabilities

EPIONE (FP7-HEALTH #602547) Natural sensory feedback for phantom limb pain modulation and therapy

CONCEPT (ERC-AG #294498) Construction of Perception from Touch Signals

Funded by Italian Ministry of Research:

AMULOS (MI01 #00319) Advanced Mulos: Motorized Upper Limb Orthotic System

HandBot (PRIN 2010) Prosthetic hand with bio-inspired tactile perception and distributed sensori-motor control

NEMESIS (GR #1591615) NEurocontrolled MEchatronic prostheSIS

REVIEWER ACTIVITY

ISI Journal:

Journal of Neural Engineering (IOPscience), International Journal of Nanomedicine (Dovepress), Medical & Biological Engineering & Computing (Springer), Soft Computing (Springer), IEEE Transaction on Biomedical Engineering, IEEE Transaction on Neural Systems & Rehabilitation Engineering, Entropy (MDPI), Neuromodulation: technology at the Neural Interface (Wiley), Journal of Sensors (Hindawi)

Proceedings:

IEEE EMBC, IEEE ICORR, IEEE EMBS Neural Engineering, IEEE EMBS Neural Healthcare Innovation & Point-of-Care Technologies, IEEE EMBS Biomedical Circuits & Systems, Design of Medical Devices

HOBBIES:

Coding, Cooking (Eating), Reading, Travelling and Sailing

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Proceedings:

IEEE EMBC, IEEE ICORR, IEEE EMBS Neural Engineering, IEEE EMBS Neural Healthcare Innovation & Point-of-Care Technologies, IEEE EMBS Biomedical Circuits & Systems, Design of Medical Devices

HOBBIES:

Coding, Cooking (Eating), Reading, Travelling and Sailing

PUBLICATIONS

PEER-REVIEWED JOURNAL ARTICLES

- Rigosa J.**, Lucantonio A., Noselli G., Fassihi A., Zorzin E., Manzino F., Pulecchi F., Diamond M. "Dye-enhanced visualization of rat whiskers for behavioral studies", (2017) *eLife*
- Wurth S., Capogrosso M., Raspopovic S., Gandar J., Federici G., Kinany N., Cutrone A., Piersigilli A., Pavlova N., Guet R., Taverni G., **Rigosa J.**, Shkorbatova P., Navarro X., Barraud Q., Courtine G., Micera S. Long-term usability and bio-integration of polyimide-based intra-neural stimulating electrodes, (2017) *Biomaterials*
- Di Giovanna J.F., Dominici N., Friedli L., **Rigosa J.**, Duis S., Kreider J., Beauparlant J., van den Brand R., Schieppati M., Micera S. and Courtine G. Cortical activation underlying natural locomotion in rats (2016) *Journal of Neuroscience*
- ***Rigosa J.**, *Panarese A., Dominici N., Friedli L., van den Brand R., Carpaneto J., Di Giovanna J.F., Courtine G. and Micera S. "Decoding bipedal locomotion from rat sensorimotor cortex" (2015) *Journal of Neural Engineering*
- ***Rigosa J.**, *Musick K.M., Chew D.J., Wurth S., Narasinhham S., Capogrosso M., Fawcett J.W., Micera S., and Lacour S.P. "Chronic multichannel neural recordings from soft regenerative microchannel electrodes during gait" (2015) *Scientific Report*
- Raspopovic S., *Capogrosso M., *Petrini F., *Bonizzato M., **Rigosa J.**, Di Pino G., Carpaneto J., Controzzi M., Boretius T., Fernandez E., Granata G., Oddo C.M., Citi L., Ciancio A.L., Cipriani C., Carrozza M.C., Jensen W., Guglielmelli E., Stieglitz T., Rossini P.M., Micera S. "Restoring natural sensory feedback in real-time bidirectional hand prostheses" (2014) *Science Translational Medicine*
- ***Rigosa J.**, *Ricotti L., Niosi A., and Menciassi A., "Analysis of balance, rapidity, force and reaction times of soccer players at different levels of competition" (2013) *Plos ONE*
- Pirino D., **Rigosa J.**, Ledda A., Ferretti L., "Detecting correlations among functional-sequence motifs" (2012) *Physical Review E - Statistical, Nonlinear, and Soft Matter Physics*
- Tombini M., **Rigosa J.**, Zappasodi F., Porcaro C., Citi L., Carpaneto J., Rossini P.M., Micera S. "Combined analysis of cortical (EEG) and nerve stump signals improves robotic hand control" (2012) *Neurorehabilitation and Neural Repair*
- Ciofani G., Ricotti L., **Rigosa J.**, Menciassi A., Mattoli V., Monici M. "Hypergravity effects on myoblast proliferation and differentiation" (2012) *Journal of Bioscience and Bioengineering*
- Micera S., Rossini P.M., **Rigosa J.**, Citi L., Carpaneto J., Raspopovic S., Tombini M., Cipriani C., Assenza G., Carrozza M.C., Hoffmann K.P., Yoshida K., Navarro X., Dario P. "Decoding of grasping information from neural signals recorded using peripheral intrafascicular interfaces" (2011) *Journal of NeuroEngineering and Rehabilitation*
- Rigosa J.**, Weber D.J., Prochazka A., Stein R.B., Micera S., "Neuro-fuzzy decoding of sensory information from ensembles of simultaneously recorded dorsal root ganglion neurons for functional electrical stimulation applications" (2011) *Journal of Neural Engineering*
- Rossini P.M., **Rigosa J.**, Micera S., Assenza G., Rossini L., Ferreri F. "Stump nerve signals during transcranial magnetic motor cortex stimulation recorded in an amputee via longitudinal intrafascicular electrodes" (2011) *Experimental Brain Research*
- Rossini P.M., Micera S., Benvenuto A., Carpaneto J., Cavallo G., Citi L., Cipriani C., Denaro L., Denaro V., Di Pino G., Ferreri F., Guglielmelli E., Hoffmann K.P., Raspopovic S., **Rigosa J.**, Rossini L., Tombini M., Dario P., "Double nerve intraneural interface implant on a human amputee for robotic hand control" (2010) *Clinical Neurophysiology*
- Micera S., Citi L., **Rigosa J.**, Carpaneto J., Raspopovic S., Di Pino G., Rossini L., Yoshida K., Denaro L., Dario P., Rossini P.M., "Decoding information from neural signals recorded using intraneural electrodes: Toward the development of a neurocontrolled hand prosthesis" (2010) *Proceedings of the IEEE*

BOOK CHAPTERS

- Al-Angari H., Kanitz G., Tarantino S., **Rigosa J.**, Cipriani Ch., Feature and Channel Selection Using Correlation Based Method for Hand Posture Classification in Multiple Arm Positions in the book "Replace, Repair, Restore, Relieve—Bridging Clinical and Engineering Solutions in Neurorehabilitation" (2014) *Springer Press*
- Carpaneto J., Citi L., Raspopovic S., **Rigosa J.**, Micera S. "Controlling prostheses using PNS invasive interfaces for amputees" in the book "Introduction to Neural Engineering for Motor Rehabilitation" (2013) *Wiley-IEEE Press*

PROCEEDINGS

- Sheshadri S., Kortelainen J., **Rigosa J.**, Cutrone A., Bossi S., Libedinsky C., Lahari A., Chan L., Chng K., Thakor N., Delgado-Martínez I., Yen S.C. Classification of Phases of Hand Grasp Task by the Extraction of Miniature Compound Nerve Action Potentials(mCNAPs) NER 2015
- Alangari H., Kanitz G., Tarantino S., **Rigosa J.**, Cipriani C. "Feature and Channel Selection using Correlation Based Method for Hand Posture Classification in Multiple Arm Positions" (2014) International Conf. on NeuroRehabilitation
- DiGiovanna J., Dominici N., **Rigosa J.**, Friedli Wittler L., Duis S., van den Brand R., Micera S., Courtine G. "Cortical influence on complex locomotion: above and beyond accuracy" (2013) *EPFL SV- Life Science Symposium, Motor control - from neural circuits and diseases to neuroprosthetics*
- Furno L., **Rigosa J.**, Panarese A., Micera S. "Assessing Spike Sorting contribution to neural implant reliability" (2013) *Proceedings of the Annual International Conference on the Neural Engineering*
- Carpaneto J., Cutrone A., Bossi S., Sergi P., Citi L., **Rigosa J.**, Rossini P.M., Micera S. "Activities on PNS neural interfaces for the control of hand prostheses" (2011) *Proceedings of the Annual International Conference of the IEEE Engineering in Medicine and Biology Society, EMBS*, art. no. 6091148, pp. 4637-4640
- Ciofani G., Ricotti L., **Rigosa J.**, Menciasci A., Mattoli V., Monici M. "Hypergravity effects on proliferation and differentiation of C2C12 muscle-like cells" (2011) *62nd International Astronautical Congress 2011, IAC 2011*, 1, pp. 415-418
- Micera S., **Rigosa J.**, Carpaneto J., Citi L., Raspopovic S., Guglielmelli E., Benvenuto A., Rossini L., Di Pino G., Cavallo G., Carrozza M.C., Cipriani C., Hoffmann K.P., Dario P., Rossini P.M. "On the control of a robot hand by extracting neural signals from the PNS: Preliminary results from a human implantation" (2009) *Proceedings of the 31st Annual International Conference of the IEEE Engineering in Medicine and Biology Society: Engineering the Future of Biomedicine, EMBC 2009*, art. no. 5332764, pp. 4586-4589

ABSTRACTS

- Wurth S., Capogrosso M., Raspopovic S., Gandar J., Barraud Q., Kinany N., Cutrone A., **Rigosa J.**, Courtine G., Micera S. Chronic functionality and biocompatibility assessment of intraneural stimulating electrode in the rat sciatic nerve, (2015) *Society for Neuroscience meeting*
- Mazzoni A., Petrini F., **Rigosa J.**, Capogrosso M., Raspopovic S., Micera S. How central inputs and force and velocity feedbacks determine motoneurons activity during voluntary hand movements, (2015) *BMC Neuroscience*
- Petrini F., Raspopovic S., **Rigosa J.**, Capogrosso M., Giambattistelli F., Zollo L., Micera S. Analysis of efferent microneurography recordings for ENG-driven hand neuroprosthesis, (2014) *Society for Neuroscience meeting*
- Musick M., **Rigosa J.**, Capogrosso M., Wurth S., Micera S., Lacour S. Chronic spike recordings from a regenerating peripheral nerve on awake and freely moving rats" (2014) *Society for Neuroscience meeting*
- DiGiovanna J., Dominici N., Rigosa J., Duis S., Friedli L., Vollenweider I., Kreider J., van den Brand R., Panarese A., Micera S., Courtine G. "Motor cortex population dynamics in freely walking rats" (2014) *Society for Neuroscience meeting*
- ***Rigosa J.**, *Panarese A., Di Giovanna J., Carpaneto J., Dominici N., van den Brand R., Friedli Wittler L., Courtine G., Micera S. "Decoding locomotor information from cortical modulations in bipedally walking rats" (2013) *Tools for Brain-Computer Interaction meeting*
- Lee J., DiGiovanna J., Friedli Wittler L., **Rigosa J.**, Courtine G. and Micera S. "Multi-unit firing rate features in hindlimb sensory-motor cortex reflect over-ground locomotion in rats" (2013) *Proceedings of the Annual International Conference on the Neural Engineering*
- ***Rigosa J.**, *Panarese A., Di Giovanna J., Carpaneto J., Dominici N., van den Brand R., Courtine G., Micera S. "Decoding locomotion from cortical modulations in bipedally walking rats" (2012) *Society for Neuroscience meeting*
- DiGiovanna J., Dominici N., Huerlimann M., **Rigosa J.**, Panarese A., Friedli L., Duis S., van den Brand R., Schieppati M., Micera S., Courtine G. "Ensemble neuronal modulations in the motor cortex of freely walking rats reflect locomotor states" (2012) *Society for Neuroscience meeting*
- Tombini M., Micera S., Porcaro C., Zappasodi F., **Rigosa J.**, Di Pino G., Assenza G., Benvenuto A., Rossini L., Carpaneto J., Carrozza M.C., Guglielmelli E., Dario P., Rossini P.M. "Toward the neural control of robotic hand: clinical and EEG changes after 4-weeks training in a human amputee" (2010) *29th International Congress of Clinical Neurophysiology, ICCN*

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- Alangari H., Kanitz G., Tarantino S., **Rigosa J.**, Cipriani C. "Feature and Channel Selection using Correlation Based Method for Hand Posture Classification in Multiple Arm Positions" (2014) *International Conf. on NeuroRehabilitation*
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