



Note from the president

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Dear BCI friends,

You are looking at freshly revamped BCI Society newsletter! This is the first edition since the 10th BCI Society meeting in Brussels in June last year, which had a record-breaking number of attendees. The positive vibe of finally getting together after 5 years since the previous in-person meeting, learning about the wonderful new developments in the field, and making plans for the future, could be felt everywhere. I hope that everyone returned home inspired and that any new opportunities for collaboration that were created at the meeting are being materialized. In October 2023, we were able to recreate the cheerful and interactive atmosphere at the BCI Society social during the Society for Neuroscience meeting in Washington. I hope you have figured out who-is-who on the renewed cocktail list! On behalf of the board of the BCI Society, I would like to express a big thanks to our sponsors for making these events possible, and to you all for your enthusiasm, which really helped making these events a success!

In the meantime, the board has started to prepare for the 2025 in-person meeting. Taking into account your recommendations for meeting venues (e.g., retreat style, but affordable), as well as the increasing size of our membership, we have selected a great place in Banff, Canada. Curious? Please flip to [page 21](#) to learn everything about our 2025 meeting venue. We can't wait to meet you all there! In addition, the different committees of the BCI Society are developing plans for the coming period, including a continuation of the successful BCI Thursdays series and specific initiatives to improve diversity and inclusion. An ad-hoc committee has coordinated the process of generating a broadly-supported definition of what is, and what is not, a BCI. The result of this endeavor, and the working definition that the BCI Society will embrace for the coming two years, can be found on [page 20](#). Thank you all for



sharing your thoughts and opinion in response to the two input rounds! More details on committee activities can be found in the Committee updates on [page 10](#). As always, we welcome any suggestions and ideas you may have. Also, if you are interested in joining one of the BCI Society committees, do not hesitate to reach out.

If you have not renewed your BCI Society membership yet, now is the perfect time! Renewing will keep you informed about our latest initiatives and ensure you have access to the BCI Society social event we are organizing during the Society for Neuroscience meeting in Chicago in October 2024.

I hope you enjoy reading the newsletter and wish you and your families a beautiful summer.

Mariska Vansteensel
President, BCI Society





Senior Member Researcher: Donatella Mattia

In each of the BCI Society newsletters, we aim to put a senior BCI researcher in the spotlight. For this edition, we asked Donatella Mattia to answer a list of interview questions about her career path, her research and her opinion on the latest developments in the field. We would like to thank Donatella for her insightful and inspirational answers.

Could you tell us a bit about your background, education and career path until now?

When and where did you join the BCI field? What is your current position and what is the composition of your research team?

I am an MD, neurologist, and neurophysiologist as training; I am habilitated as a full professor in neurology. Since 2004, I have been the head of the "NeuroElectrical Imaging and BCI" lab and since 2022 of the "Innovation Technology for Neurorehabilitation" department at Fondazione Santa Lucia IRCCS, in Rome. I must say that I joined the BCI field late in my career in 1999 (after I came back from Montreal -QB-CA, where I spent 5 years doing basic research in in-vivo electrophysiology of animal and human brain) thanks to Febo (Cincotti) who introduced me to EEG-based BCI within an EU project. At that time, he showed me how EEG signals could serve to control

external devices for communication and control. I had always dealt with brain electrophysiology focused on motor system, and this use of EEG signals looked to be an extraordinary way to enhance (even emulate) communication in people with severe disability due to incurable neurological diseases (eg., ALS). Since then, my group has fostered a multidisciplinary team in which neuroscientists, neurologists, psychologists, and academics in biomedical engineering (from the Department of Computer, Control, and Management Engineering at University of Rome Sapienza) have been fostering the application of BCI technology in a clinical setting, from a technical, clinical and neuroscience point of view.

What attracts you to BCI research?

After more than 20 years in the field, I am still fascinated by the evidence that humans can learn to modulate and use their brain (electrical) activity to serve as a kind of sixth sense beyond the natural pathways to interact. BCI is the instrument to enable this, and beyond that, it can not only substitute but even restore lost brain function. As a neurologist, I found this an extraordinary window open to our understanding of the CNS.

What, in your opinion, has/have been your most significant contribution(s) to the BCI field?

I believe my (group's) most significant contribution has been to design and adapt BCI technology to functional motor rehabilitation purposes after stroke. In 2008 (under the umbrella of the EU project TOBI), we approached neurorehabilitators asking "what would you think about a technology which by exploiting EEG oscillatory



activity underlying motor imagery will allow stroke patients to perform such cognitive task under controlled conditions?" Today it appears obvious, but at that time, it was quite a change in the paradigm of MI - based BCIs used for control purposes. For us, this was the beginning of bringing BCI into the clinical realm and providing knowledge for evidence-based use of BCI to target beneficial brain plasticity and thus, to improve long lasting function.

4 What do you enjoy most in your current position or in BCI research in general?

What I enjoy the most is seeing how multidisciplinary the BCI community has become and how far BCI applications have gone with the participation of real end-users and stakeholders.

What do you consider new important and positive developments in the BCI field?

Over the past 10 years, BCI research has greatly developed, and several advancements in terms of technology and knowledge have been achieved. I believe the accumulating evidence of (mainly EEG) BCI-based interventions able to target and guide brain plasticity occurring after stroke, SCI, and other neurological diseases represents a breakthrough in the field. In this respect, the multidisciplinary approach to BCI development is the key to success. To me, this has been shaping BCI technology to exploit brain activity either for function improvements or for natural control of prosthetic devices to re-establish motor and speech (communication) control.

What aspect or development worries you?

In my field of BCI research, I am worried by those technological developments that may not take into account evidence coming from basic and clinical trials/ studies that are required for sensible technology development. I believe this knowledge has to inform the efforts in computer science and engineering research to ultimately advance more in terms of system reliability. We also need more industrial engagement to ensure for a solid and possibly standard technology to be produced for a widespread of BCI-based interventions for rehab. and restore. In general, BCI technology (implantable as well as not-implantable) also needs ethical awareness and consideration (especially for non-medical use in lay people); this aspect (to

me) does not require exclusive treatment for BCIs but it has to be part of the general approach to neurotechnology (I think to a recent discussion about new neurorights); thus we, as BCI community need to integrate with neuroethical experts.

What advise would you give to junior researchers entering the BCI field now?

I had been impressed by the participation and enthusiasm of future generation of scientists during the last International BCI Society (2023)! New ideas are coming up from them, so what could I ever add?! My advice is again to try to expose yourself to a multidisciplinary exchange in the BCI field to enrich your work, increase the chance of success and advance together as neuroscience community.



You always had a strong focus on including patients into BCI research - what would be your advice for newcomers in applying BCIs with patients?

To begin with, I would say to make as clear as possible what you expect from a given BCI-based intervention in terms of beneficial effect and why you expect that. This will make easier to select your sample of patients that best suite with your working hypothesis. Always keep in mind how precious is their contribution to research that, most of the time will be of benefit for future and not necessarily for them. This is crucial to engage them, according to a transparent and intellectually honest user centered design. Remember also that at least in the field of rehab/ functional recovery (eg. in stroke), no single intervention is valuable for all patients and even more for those technology based.

You work(ed) a lot with stroke patients and their restoration of upper extremity. What is the main message to newcomers in the field?

I would stay with what I have just said (answer 8). Those suggestions are applicable to upper limb motor recovery as well. Specifically, I would add that after so many years into stroke I have learned to look not only to those patients who respond to a given BCI based intervention but also to those who do not. Knowing who are the best candidates for a given BCI based intervention will help to design future BCIs more efficient (also in terms of reliability!).

Related to the question before, what is the missing link for a "real" use of BCIs in clinical settings? Or is it possible with today's BCIs?

To me, we first need to better understand who will benefit from and why; second, we should try to understand which are common points between the several available clinical trials focused on BCI-stroke in order to derive some initial guideline for apply BCI in stroke. It would be a great initiative for the BCI Society to address this point. Today's achievements in clinical application of BCIs are still fragmented among the several groups of researchers and thus, the risk is to disperse the knowledge and reduce the potential for BCI to enter in the clinical portfolio of new strategy to restore/improve brain function.



10th BCI International Meeting Update

Balancing Innovation and Translation

June 6 – 9, 2023
Sonian Forest, Brussels, Belgium

The 10th International BCI Meeting was a big success! Our program featured academic events like plenary lectures, research sessions, posters, and satellite events as well as social events like lunches with leaders, BCI movie night, and outdoor “bonfires.” The meeting also featured three sessions of workshops and BCI Master Classes that each had seven workshops or classes. Several exhibitors had booths with their latest BCI systems and other products with live demonstrations. The venue and surrounding forest were excellent and maintained the retreat-style atmosphere that we had at all prior BCI Meetings. Additionally, Jonathan R. Wolpov was the recipient of the Lifetime Achievement Award!

The BCI Meeting was organized by the non-profit BCI Society. We are currently discussing plans for our next meeting in 2025. If you’d like to discuss the next meeting or other BCI Society activities, please join our Discord channel discord.gg/DXw6BErk or email us at bci@podiumconferences.com.

Number of participants:

456 delegates

237 labs

39 countries

Program:

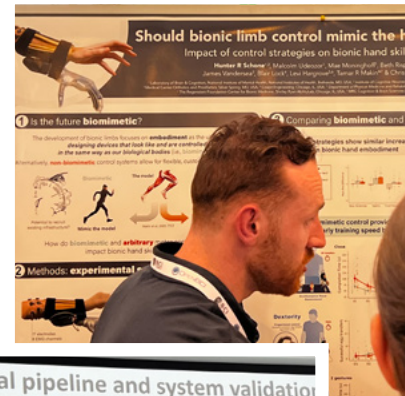
[DeArmond-BCI-2023-program-v108.pdf](#)

Abstract Book:

[2023-Proceedings-V11.pdf](#)

Watch Videos on YouTube:

www.youtube.com/watch



Early Career Award Winner Announcement



Tell us about your early career journey and your area of research.

My path was rather boringly linear: in my first year at university, I saw a guest lecture by John Donoghue presenting the early results of a BCI using Utah arrays, and I was hooked – I decided I was going to enter this new and then-tiny field of brain-computer interfaces. I ended up working for John and Leigh Hochberg for two years after graduating, before going on to pursue my PhD in neurosciences in a lab where I developed intracortical cursor BCIs in a pre-clinical macaque model. I also studied the fundamental neurobiology of how arm movement plans and sensory feedback were encoded in the dynamics of motor cortex. For my postdoc, I returned to human BCI and trained with Jaimie Henderson and Krishna Shenoy. My first project was to adapt the high performance 2D decoding algorithms from that lab to control more robot arm degrees-of-freedom.

Sergey Stavisky to be the winner of the 2023 Early Career Award

Midway through my postdoc, however, I got excited by the rapid progress that ECoG groups were making decoding speech. I figured that we should be able to do at least as well, if not even better, with intracortical Utah arrays, and that this could be a near-term win for BCIs because there was such an urgent need for restoring lost speech. That's what I shifted my focus to: I showed that we could decode speech surprisingly well from the hand area of motor cortex, where we already had Utah arrays in our clinical trial participants who could speak (homunculus what?!). This set the stage for us expanding the clinical trial (and writing a bunch of grants) to place electrodes in ventral (speech) motor cortex to try to restore speech. That's what I'm working on now, and if you're interested you can read more about our progress on medRxiv: <https://www.medrxiv.org/>

Who has had the biggest influence on your current research and why?

My PhD mentor (and postdoc co-advisor), Krishna Shenoy, has been my greatest professional influence. When I first joined his group at Stanford, they were

setting new records for 2D point-and-click BCI, and I learned from him that concerted effort to achieve technical excellence and keep improving a BCI, when achieved over and over, can have a huge impact: that lab basically doubled BCI communication bit-rate four times over the course of a decade. I started the journey to build an intracortical speech neuroprosthesis midway through my postdoc, and that remains a major focus of my ongoing research.

That said, Krishna was perhaps better known for his motor neuroscience and work on computation through dynamics than for his BCI advances, and I internalized this emphasis on doing both basic and translational science. Today, I am trying to understand the neural basis of speech and language so that we can do a better job of restoring this ability.

Most importantly, he was an extremely kind mentor who believed in his trainees, gave them intellectual room to develop their ideas, and always prioritized their success. I saw how effective this research culture was and have tried

to emulate it. Even now, many of my collaborators – ranging from other BCI researchers to theory/computational neuroscientists – are part of the wider Shenoy group alumni network. So that wonderful influence on my current research continues.

What is the best part of your work?

The trainees I work with!! One-on-ones and group meetings with project updates are definitely the highlights of my week. The whole team is working so hard, they're finding intriguing hints in the data that we're wrestling with interpreting, and almost every week someone shows me how they've meaningfully improved the capabilities of the speech neuroprosthesis. Things don't always work right away, but eventually they do, and when that happens it's so much fun!

Beyond just the science part of it, it's a joy to watch trainees' professional growth and witness them experiencing the payoffs of this career. For example, I just back from NCM 2024 in Dubrovnik, and it made me so happy to see a PhD student in my group give his first major poster presentation, and to see a postdoc in the group give a talk to 300+ people showing record-setting BCI performance. For both of these trainees, it was their first international conference, with all the accompanying fun of exploring a beautiful Mediterranean city with other BCI/motor neuroscience nerds.

How do you perceive this award to help you professionally / further develop your career?

It provides encouragement; it's really a privilege to be recognized by one of my core societies. After starting a new lab, it takes a long time for projects to lead to papers, so receiving this award – and thus hearing that my community thinks that what I've done so far is impactful – is especially motivating.

For similar reasons, this award is very helpful as external validation during my early career. I'm now at a stage where the lab has hit its stride on our first few projects, and in parallel I'm trying to convince funders and collaborators to help me solve a wider set of problems. I hope this award helps lend additional credibility and momentum to those efforts.

What do you think are the main challenges facing early career researchers in the BCI field?

For early career independent researchers who want to work in implanted BCIs with human participants, it is hard to get up and running with access to participants and neural data. The equipment is expensive, you need clinician collaborators who are committed to the project, and it's a huge lift to launch a project. Moreover, if the early career researcher is driving most or all of the study, then they need a critical mass of people in their lab to do all the work needed to make full use of the participants' commitment.

Making this possible for early career researchers requires institutions and established researchers to invest a lot to support early career researchers and help them take off – I've been very fortunate in this respect both in terms of the resources UC Davis invested in the lab that I co-founded with neurosurgeon Dr. David Brandman (also a new PI), and in the support from our BrainGate consortium colleagues as well as other senior investigators in the field. If there's a department chair or institute director reading this, I hope that the pace with which David and I delivered returns on these investments inspires others to provide similar support to their junior BCI faculty colleagues.

Looking back, what advice do you have for someone just commencing their PhD/Post-doctoral studies within the BCI field?

For PhD students that are interested in the BCI field, but aren't in a BCI lab (there still aren't that many labs), I would say: don't worry, just join the best lab you can in terms of mentoring and culture and focus on learning transferable skills. For example, the first three postdocs to join me at UC Davis had not worked on implanted BCIs before, but they had relevant skills from their PhD (such as signal processing, decoding, and systems neuroscience). They all quickly learned the BCI-specific skillset and are now doing some really exciting things.

For both PhD students and postdocs: I encourage you to not overfit your outlook to the doom-and-gloom about career prospects that I often see on Twitter and other media. When I look around at the global network of peers I met when I was a trainee, and also at folks who are a few years more junior, I see that the majority of people are getting amazing jobs (either as professors or in neurotech industry) that they're passionate about and where they're rewarded well. We are fortunate to be in a field that is growing fast and I don't foresee that slowing down anytime soon.

Tell us something about your future plans.

There's still more to do to restore the full expressive range of speech through a brain-computer interface. But looking beyond that, I think many of the same principles – estimating a high-dimensional neural state in real-time and responding accordingly – are applicable to the cognitive disorders that are an immense burden both at the scale of individual patients and their families, and society as a whole. I believe that cognitive neuroprostheses are going to play a major role in addressing this need.

To get there, we are going to need a way to record and stimulate from thousands of sites in the brain at (or at least near) single-neuron resolution. I'm working on several projects to bring better neural interface devices to human use. Some of these efforts are near-term and I hope to have results to share in the next year or two, others are longer-term but even more ambitious. Stay tuned!

Upcoming Partnered Event

9th Graz BCI Conference

September 9 - 12, 2024

For details, please consult the [website](#).



Awards Committee

Members: **Theresa Vaughan, Matt Fifer, Dean Krusienski, Donatella Mattia, Mariska Vansteensel**

The committee's mandate is to acknowledge the contributions of Society members to the field, and to promote and facilitate the submission of high-quality nominations to the Society awards. Since last GA, the Awards Committee has:

- Adjusted the procedures for Early Career Awards, to reflect the multidisciplinary character of the field, and in accordance with valuable feedback from the jurors.
- Coordinated the 2023 Early Career Award process. The winner, Sergey Stavisky, has been announced and will give a presentation at the 2025 meeting in Banff. A big thank you to the jurors of the 2023 edition!

Audit Committee

Members: **Walter Besio, Robert Leed**

The Audit Committee received all the financial and accounting information, as well as balance sheets in time for annual review. All questions were effectively addressed, ensuring satisfaction for the audit committee. Financially, this was an exceptionally successful year for the society due to substantial earnings from the BCI Meeting registration fees. The overall net income amounted to approximately \$225,000. This positive balance is very important for the society given that meetings serve as the primary revenue source for the society.

BCI Definition Committee

Members: **Rob Gaunt, Gernot Müller-Putz, Betts Peters, Reinhold Scherer, Marc Slutzky, Davide Valeriani, Theresa Vaughan, Mariska Vansteensel**

The goal of the BCI Definition Committee was to put forward a clear and comprehensive definition of a brain-computer interface that reflects both the history and current state of the field, that simply captures the essential aspects of what a BCI is and is not, and that is useful for the Society in both internal and external communications.

Results of the two surveys conducted included 137 Respondents (recent and current BCI Society members) and the decided definition is as follows:

A brain-computer interface is a system that measures brain activity and converts it in (nearly) real-time into functionally useful outputs to replace, restore, enhance, supplement, and/or improve the natural outputs of the brain, thereby changing the ongoing interactions between the brain and its external or internal environments. It may additionally modify brain activity using targeted delivery of stimuli to create functionally useful inputs to the brain.

Communications Committee

Members: **Brendan Allison, Christian Herff, Jane Huggins, Natalie Mrachacz-Kersting, Gernot Müller-Putz, Stephanie Scott, Robert Sutherland**

The committee serves to coordinate communications between the BCI Society, its membership, and the public on matters central to the Society's vision and mission. The committee has actively been working on initiatives to continue to develop our media outreach and engagement. The committee has also composed and updated the format for the BCI Society's 6th newsletter.

Fundraising Committee

Members: **Robert Gaunt, Donatella Mattia, Gernot Müller-Putz, Nick Ramsey, Reinhold Scherer**

The mandate of the committee is to assist the Society in the planning, coordination and implementation of all fundraising activities in support of the projects and activities of the society. Ongoing activities conducted by the committee for this year include:

- Development of a comprehensive fundraising strategy and plan to diversify the portfolio of activities that the BCI Society can offer.
- Identifying key stakeholders and update the stakeholder list.
- Identification of sponsorship (Categories: Program, Award Session, Social Event, Support for Students or Attendees, Delegate Communication and Advertising) and exhibition opportunities for the 11th International BCI Meeting 2025 and plans for reaching out to key stakeholders.

Industry Advisory Committee

Member: **Davide Valeriani**

The mandate of the BCI Society Industry Advisory Committee is to support the Society mission and objectives by providing strategic guidance, expertise, and insights into industry developments of BCI.

The committee will advise on industry trends, challenges, and opportunities relevant to the BCI Society's mission. It will also identify, develop, foster, maintain and strengthen new and existing relationships with industrial partners and their representatives.

Up to 9 seats are open to the committee. For the full Term of Reference and how to join the committee, please visit the [website](#).

Membership Committee

Members: **Luke Bashford, Stephanie Cerna, José del R. Millán, Donatella Mattia, Gernot Müller-Putz, Thomas Oxley, Victoria Peterson, Betts Peters, Adi Tarigoppula, Davide Valeriani, Theresa Vaughan**

The Membership Committee aims to create benefits for members of the Society and thereby contribute to recruiting, retaining and engaging members. The membership committee is excited to welcome a new Chair, Davide Valeriani, and three new members: Thomas Oxley, Betts Peters, and Victoria Peterson. New members means new ideas. Thus, along with carrying forward the membership survey and continuing to strategize how to get underwriting for an equipment grant intended to support research in under-resourced laboratories, we are planning new initiatives. Specifically, Victoria is preparing a proposal on events to enhance diversity, especially in the Latine community.

Postdoc and Student Committee

Members: **Tan Gemicioglu (Chair), Davide Valeriani (Board Liaison), Sajjad Ahmed Ghauri, Juan Jose Gonzalez Espana, Erica Floreani, Helen Huang, Oluwagbenga Paul Idowu, Alex McClanahan, Megan Parsons, Marino Sabijan, Valeria de Seta**

The Postdoc and Student Committee represents the trainees of the BCI Society. Its goals are to organize professional development activities for students and postdocs, including virtual seminars with BCI experts, ad-hoc networking opportunities based on research interests, and international collaborations between trainees. Some activities of the board include:

- BCI Thursdays: Introducing a new series centered around Patients and Users. Preparing to hold first few sessions soon.
- Unplugged Podcast: A new podcast to discuss recent advances in BCIs. We are currently working on marketing materials and gathering speakers for first episodes.
- Initiatives in the work (stay tuned): mentorship event, local chapters, tutorials and hackathons.

Do you know someone interested in sponsoring one or more of these initiatives? Get in touch at StudentPostdoc@bcisociety.org.

JOIN OUR DISCORD: discord.gg/DXw6BErz

Standards Committee:

Members: **Cuntai Guan, Betts Peters, Reinhold Scherer, Davide Valeriani**

The role of the Standards Committee is twofold:

- Develop sustainable relationships with standardization organizations and relevant stakeholders
- Support and advise standardization organizations in the development of relevant standards and regulations

Activities have included:

- Survey of members on whether and to what extent the BCI Society should participate in an advisory capacity in international standardisation efforts
- Collaborating with researchers from various institutions and professionals from organizations such as the Institute of Electrical and Electronics Engineers (IEEE), International Organization for Standardization (ISO), British Standards Institution (BSI), International Neuroinformatics Coordinating Facility (INCF), Food and Drug Administration (FDA) and National Institute of Health (NIH) to bolster standardization efforts.

Status and Bylaws Committee

Members: **Jennifer Collinger, José del R. Millán, Nick Ramsey Marc Slutzky, Mariska Vansteensel**

The committee purpose is to assess and recommend changes to the Bylaws and Constitution that are consistent with the Society's overall mission and purpose. The committee is currently active in adapting the bylaws and processing changes to the society's constitution.

Featured Members Highlighted/New Lab Announcements



Dr. Marius Klug is heading the Young Investigator Group Intuitive XR, which investigates (neuro-)physiological User-Interfaces for virtual and augmented realities at Brandenburg Technical University Cottbus-Senftenberg.

How did you end up in this position:

Initially, I was planning to study electrical engineering, but then Cognitive Science really sparked my interest. I followed this up with a Master in Cognitive Science as well, but with a focus on computational methods. Already during my studies, I was a research assistant collecting data for EEG-BCI studies with ALS patients at the MPI Tübingen. After a Master thesis in Finland investigating happiness correlates with EEG, I actually thought I never wanted to work with EEG again, because the method seemed too distant from practical use. Until a temporary research position with Klaus Gramann at TU Berlin opened up that combined EEG and virtual reality. One thing led to another and 5 years later, I finished my PhD in that very group about extracting signal from the noise in wearable EEG recordings in VR. During this time in Berlin, I met Thorsten Zander, who's ideas about passive

BCI greatly inspired me and who later established the connection to the BTU, where he had started as a professor in the meantime. I am incredibly fortunate to now have received the opportunity to start my own research group there as well so quickly after my PhD!

What is the focus of your research group?

We use (neuro-)physiological data as inputs for virtual and augmented reality. We make use of passive BCI and other biomeasures and want to bring interactivity in VR to another level, enabling experiences that cannot otherwise be achieved. That ranges from entertainment over touchless user interfaces up to completely adaptive virtual environments. VR is an extremely powerful tool here, because we know everything the participant sees and does, and we can change things on the fly.

To achieve this, we want to tackle three main challenges:

1. We want to investigate the necessary signal processing and decoding steps for different applications and cognitive states.
2. Show first feasibility studies, concepts and uses cases of the combination of BCI and virtual reality.
3. Transfer these findings to products that add benefit to the user experience.

My team needs to be very interdisciplinary. Currently, it consists of a PhD candidate with a more technical background looking at Machine Learning questions, while the other PhD candidate has experience in user experience and will investigate emotionally aware virtual agents. Both have had previous training with mobile EEG in VR though, which is great!

What are developments in the BCI world that worry you?

I'm worried that the general public is worried about the wrong things in BCI research. Instead of being afraid of Elon Musk reading our thoughts and humanity becoming cyborgs, I think our primary concern should be the possibility that physiological data will be used for even more powerful user preference tracking, and the possibility of figuring out cognitive and emotional reactions to any stimulus can lead to critical privacy concerns.

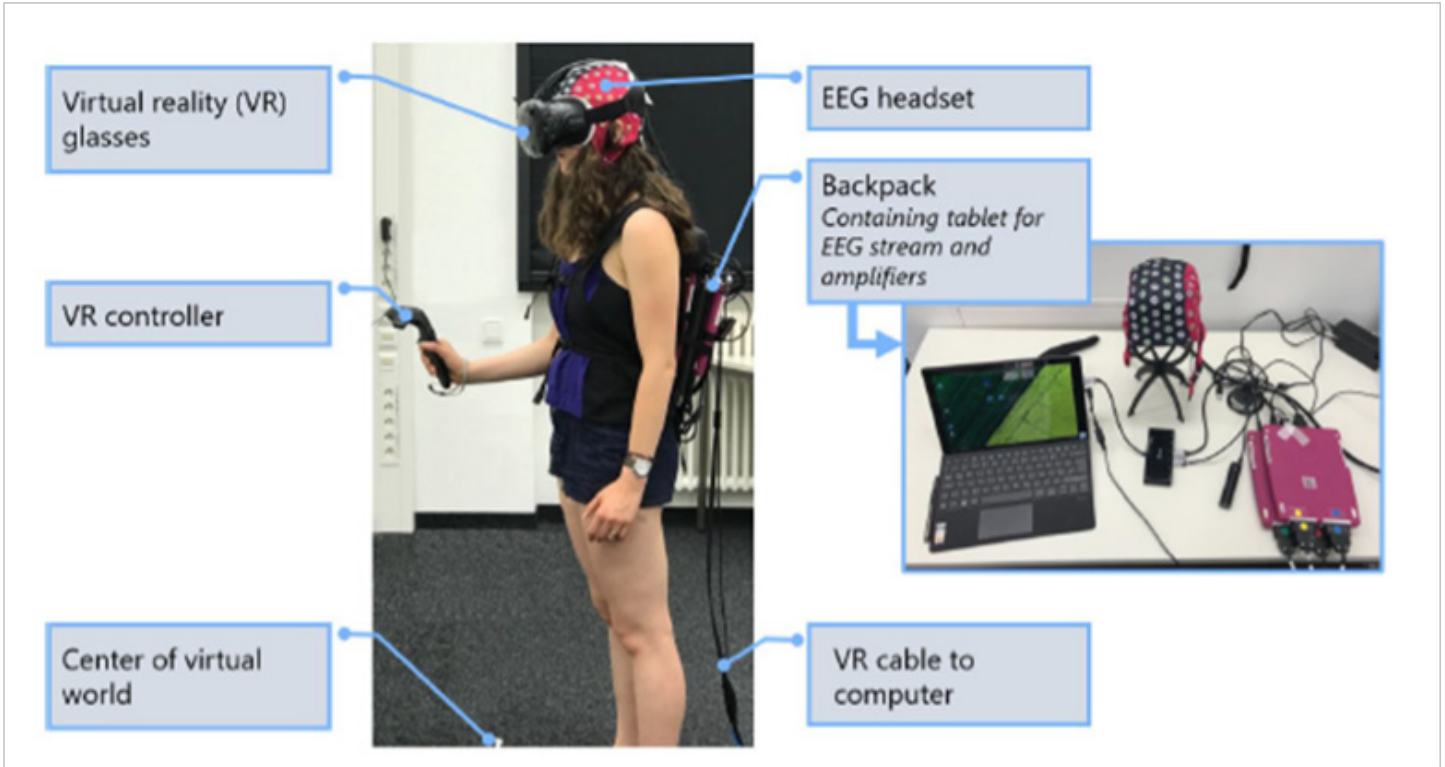
This is one of the reasons why I started a Discord channel to discuss developments in the field and bring together BCI experts and the general public:

discord.gg/7MJQ3f

What would you recommend to a young researcher starting out in the field of BCI?

Learn Python! And see the potential of BCIs beyond communication and control. In my opinion, passive BCI and continuous mental state tracking, and the combination of EEG and other physiological

measures like wristband EMGs or eye trackers will allow us to build extremely exciting user interfaces that allow an engagement far beyond anything that has been presented thus far.



Virtual reality (VR) glasses

VR controller

Center of virtual world

EEG headset

Backpack
Containing tablet for EEG stream and amplifiers

VR cable to computer



Victoria Peterson, IMAL, UNL-CONICET, Argentina

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How did you get interested in BCIs?

When I was in my senior years in university, there was a call for joining a BCI project as an undergrad student. The position caught my attention, since I was feeling inclined towards the idea of conducting research in the area of signal processing. Of course, the idea of connecting the brain with the computer was something absolutely new for me, and I thought, "it seems to be cool." I may say that when I applied, I would have never thought I would be selected. While my grades were high, they were not the highest, and when you are a student you sometimes believe you are only what your grades say about you (which is not true!). I was also in my 4th out of 6 years of the Bioengineering program, only 21 years old. But it may have been one of those first magical moments that changed people's lives: I got the position. I started the undergrad research position and I completely fell in love with BCI. It combines all my interests: signal processing, artificial

intelligence, human-centered systems, neuroscience, all together to improve people's quality of life. I did my bioengineering thesis on this topic, and then decided to apply for a PhD fellowship in machine learning algorithms and BCI. If I count those university years, overall it has been something like 12 years since I started working in BCI.

Where did you get your academic degree(s)?

I studied Bioengineering at Universidad Nacional de Entre Ríos, in the Engineering Faculty located at Oro Verde, Entre Ríos, Argentina. Then I got my PhD degree in engineering, signal systems and computational intelligence at the Universidad Nacional del Litoral, in Santa Fe, Argentina. I did my PhD thanks to a CONICET research fellow.



What are your main interests within BCI research?

While the development of robust machine learning solutions for brain decoding can be my main strength, my main interest and pursuit is always to apply our algorithmic development in real BCI scenarios. I know this may sound obvious for other people, but in Argentina conducting research and transferring it into clinical application is not as fluent as in other countries may be. I pursue to conduct BCI research in all stages, from data recordings to real-life applications, always with the key ingredient of machine learning-based solutions.

Could you tell us more about your lab and university?

In Argentina research is mainly supported through the National Scientific and Technical Research Council (CONICET). PhD, Postdoc, research assistant and research positions salaries are paid throughout CONICET. As such, researchers are part of CONICET institutes that may be linked to



Who are some of your main collaborators, both in and out of Argentina?

In Argentina I closely collaborate with people from sinc(i), CONICET-UNL institute. I did my PhD studies at the sinc(i) and I kept my collaborations with several researchers from that institute. In fact, there are also people working in BCI in that institute. We are also starting collaborations with FLENI institute, the main neurorehabilitation institute in Argentina, where we aim to translate our research into activities for patient rehabilitation. Internationally, thanks to the different opportunities I have had to conduct research abroad, I have collaborated and I currently collaborate with different research labs across the globe. Currently I collaborate with the Rehabilitation Engineering Lab, RELab, ETH-Zurich in Switzerland and the Brain Modulation Lab, at the Massachusetts General Hospital, Boston, USA.

What are your favorite people, groups, stories, or devices in the BCI community?

From the very beginning and still now I have always admired the Berlin BCI group as well as the Graz BCI group. They were, in a way, my virtual professors in respect to BCI. I didn't have an advisor completely devoted to BCI. In fact, my PhD advisor was a mathematician who got to know about BCI thanks to me. As it can be imagined, there was a lot of relying on myself, learning from others. Reading about the state-of-the-art, understanding where to better publish, which conferences were the most important ones

Could you tell us more about other BCI activities in Argentina?

In Argentina we are not so many conducting BCI research activities. Of course, people from FI-UNER, in the lab where I did my bioengineering thesis, are conducting research on this topic as well as in other universities throughout Argentina. It must be said that there are also people working in conductive neuroscience or more human-machine interfaces. With the deep belief that we need to connect with others to improve our research, I have organized seminars, given BCI courses as well as organized research sessions in national conferences to get to know other researchers in Argentina working under the big umbrella of computational neuroscience. This is undoubtedly a research field that is and will be growing more and more, and my country is also aligned to that.

a University. In my case, my lab (Computational Neuroengineering lab, NiCALab) is part of the Institute of Applied Mathematics of the Litoral (IMAL, CONICET-UNL), located at the CCT-CONICET Santa Fe, Argentina. I began my CONICET assistant research position in April 2022, but I essentially started running my "own lab" during my Postdoc at IMAL in 2019. Even though I was the sole individual working on BCI within the entire institute, I received backing to initiate the development of my own research directions. With the support of grant budgets and awards I secured during my postdoc, we managed to outfit the lab with affordable consumer-grade EEG recording devices. This allowed me to start collecting our own data and evaluating our algorithmic solution in real-world scenarios. For me, it was essential to truly feel that I was conducting BCI research and not just research with BCI applications. Currently, the lab has an assistant researcher, one PhD student, one Master student and several undergrad students.

was a matter of self-education. So, when I “found” those researchers, I started to follow them either by their publications or their personal websites and social media profiles. Fabien Lotte is another researcher that through his website and state-of-the-art surveys has helped me in understanding where to stand. Nevertheless, today the list is even bigger. It is hard to pick only one, but it is really fascinating what is happening in the community in recent years.

What are your favorite characters, groups, stories, or devices in BCI science fiction?

This is funny. While BCI can trigger people’s interest in science fiction movies, in my case I only think about them as promising rehabilitation or restorative tools. There are so many science fiction movies that I love to criticize and compare to what could or could not be possible. But, maybe I’m not that much of a cinephile to give a better answer.

What could the BCI Society do to foster BCI R&D worldwide?

Last year marked my first attendance at the BCI meeting in person. While abroad scientific gatherings may be routine for American or European researchers, for those in low-income countries, it represents a significant effort (and at times, a distant dream). We often operate with tight to nonexistent budgets for attending international conferences, relying on fellowships or travel awards to facilitate our participation. As a Latin American woman, I understand the pressing need to highlight our work, its

origins, and to demonstrate that despite potential economic constraints, we can excel. This is why I strongly advocate for diversity research visibility and support in any form. These types of initiatives are commendable (and I applaud the society for implementing them). As part of the society, I am committed to doing my utmost to assist BCI in its growth and recognition in LATAM.

Victoria Peterson’s minibio

Victoria is a CONICET Assistant Researcher at IMAL, Santa Fe, Argentina and Associate Professor at Universidad Nacional del Litoral, Argentina. She obtained her degree in Biomedical Engineering in 2013 and her Ph.D. in Engineering, Signals, Systems and Computational Intelligence in 2018.

In 2019, she joined IMAL, UNL-CONICET as a CONICET postdoc fellow and later in 2021, she became a Harvard Research Fellow at the Brain Modulation lab in the Massachusetts General Hospital, Boston, USA. Victoria is currently an external collaborator of the Brain Modulation Lab and was a visiting Doctoral Student at the RElab, ETH Zurich in 2017 and 2018. With over 10 years of experience in machine learning solutions for brain signal decoding in the context of brain-computer interfaces, one of her research projects was nominated for the BCI Award 2021.



JNE Special Issue on Brain-Computer Interfaces

Deadline extended to July 31, 2024

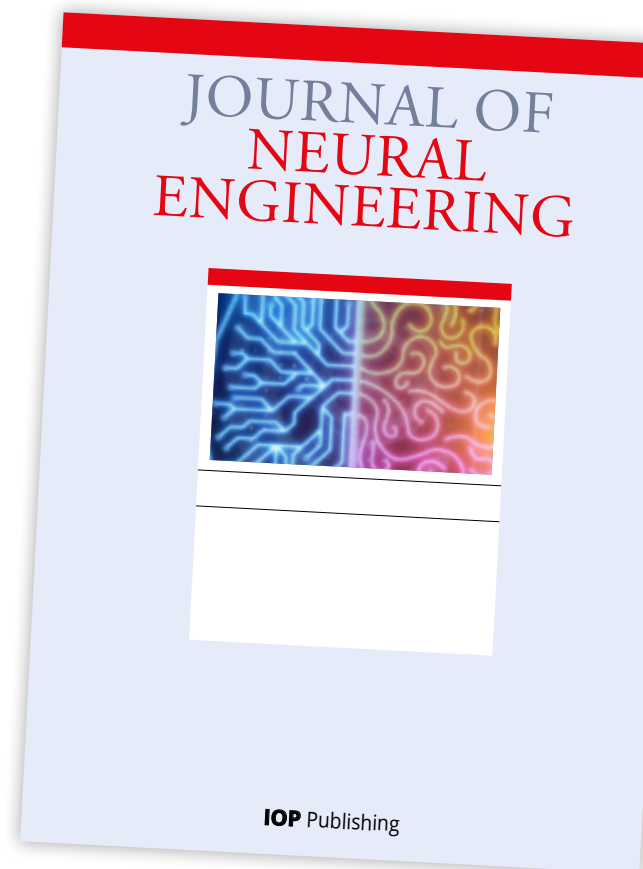
The BCI Society is now assembling a peer-reviewed special issue for the Journal of Neural Engineering around the work that was presented at the 10th International BCI Society Meeting in Brussels, and would like to invite you to submit your work there as a full research paper.

The new deadline for submission to the special issue is July 31, 2024. The editorial board includes the meeting organizers, Drs. Jennifer Collinger, Natalie Mrachacz-Kersting, Donatella Mattia, Mariska Vansteensel, Davide Valeriani, and Ms. Theresa Vaughan. We would like manuscripts to include work that was either presented at the meeting or is directly related to that work.

The Journal of Neural Engineering does not charge for submission, and adheres to a strict publication schedule. This means the papers will be published in the special issue as soon as they are accepted, without waiting for the whole special issue to close.

We really hope you can accept our invitation and look forward to creating a resource for the BCI community that summarizes the current state of the field.

The issue will be hosted on a dedicated page on the journal's website. For more information, please see iopscience.iop.org/collections/jne-240103-452 or contact the journal jessica.wheeler@iopublishing.org



Topics and Events of Interest for BCI Society Members



BCI SOCIAL AT SFN

Save the Date

Monday October 7, 2024, 7pm
VU ROOFTOP, CHICAGO

Global Membership Initiative

The BCI Society wants to ensure that membership fees do not unduly restrict who is able to join our society. We are pleased to introduce a reduced membership fee determined by the member's country of residence. Determination is made by using tables listing low income, low-middle income, and upper-middle income countries as defined by the World Bank. That is, low-income countries pay 20% of the full-member fee, lower-middle income countries pay 40% of the full-member fee, and upper-middle income countries pay 75% of the full-member fee.

Please note you must be based full-time in the applicable countries in order to be eligible for the discount. Please contact us to receive the membership code.

BCI Society Event: Next BCI Social Party at SFN



Become a Member or renew your BCI Society membership today

Membership in the BCI Society is open to all scientists, principal investigators, post docs, and students from around the world involved in the many research and practical aspects of BCI research. We welcome all involved in BCIs, including engineers, clinicians, therapists, business people and users of BCI technology. For more information on additional membership benefits please visit our link!

Membership Information:
bcisociety.org/membership/

What are some of the benefits for members?

- Discounted registration for the BCI Society Workshop Series
- Complimentary registration for the Next Generations events
- Complimentary registration for the Master Classes
- Access to member-only initiatives and activities

Our one or two-year membership cycle has started in January 2024!

For **one year** / for **two years**

Regular: US\$155 / US\$235

PostDoc: US\$105 / US\$165

Student: US\$70 / US\$105



BCI Definition

Based on results of current and recent BCI Society members' vote on a working definition for a BCI, on May 23, 2024, the Board of the BCI Society voted to accept this result and to embrace a working definition of a BCI for the coming 2 years for our internal and external communication. We recognize that as our field progresses through ongoing dialogue, new discoveries, and technological breakthroughs, our definition may evolve. Therefore, we anticipate future opportunities for the community to contribute their insights, helping us refine and enhance this definition. In two years' time, and based on new insights that may arise, we will consider if the working definition should be reconsidered.

We would like to thank you all for taking the time to fill out the survey, for sharing your thoughtful opinions and for your vote. We really appreciate your commitment to a strong and connected BCI Society!

BCI Working Definition:

A brain-computer interface is a system that measures brain activity and converts it in (nearly) real-time into functionally useful outputs to replace, restore, enhance, supplement, and/or improve the natural outputs of the brain, thereby changing the ongoing interactions between the brain and its external or internal environments. It may additionally modify brain activity using targeted delivery of stimuli to create functionally useful inputs to the brain.

Key terms:

- **“Brain”** includes the cerebrum, the diencephalon, the brainstem, and the cerebellum. It does not include the cranial nerves. Furthermore, it does not include the measurement of intention or information (that could have originated in the brain) obtained from downstream areas of the nervous system (e.g. peripheral nerves or muscles).
- **“Computer”** may refer to a device typically referred to as a computer, but also to other computerized devices, such as robot arms, electrical stimulation devices, powered wheelchairs etc.
- The terms **“internal”**, **“external”**, **“input”**, and **“output”** should be read in relation to the brain as defined above.

Please note that the selected working definition will not serve as a strict delineation of the interests of the BCI Society: knowledge gained in the wider areas of interaction between the CNS and its external and internal environments, neuroimaging, neurostimulation and other neighbouring fields will remain highly valuable for the development of usable BCIs.





Next Meeting Location



11th International BCI Meeting

June 2-5, 2025, Banff, Canada

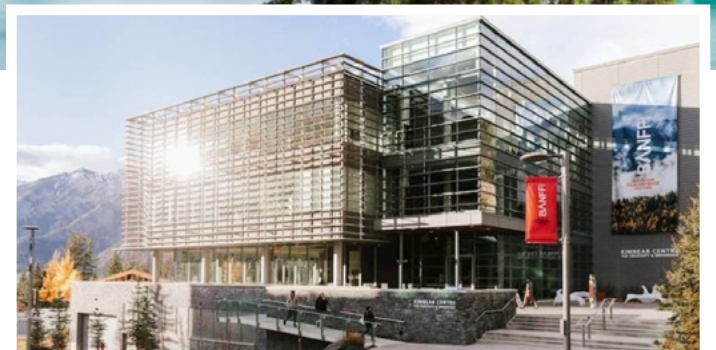
Banff Center for Arts and Creativity

bcisociety.org/bci-meeting/

The BCI Meeting brings together scientists, engineers, and clinicians involved in BCI research and clinical use, to review the present state of the field, address key issues critical to further progress, and promote the education and participation of young researchers. This meeting should, like its predecessors, contribute greatly to BCI research and development.

Meeting Details:

bcisociety.org/bci-meeting/destination/



Key Dates

Note: exact dates subject to change

WORKSHOPS

Sep 12, 2024	Call for workshop opens
Oct 31, 2024	Last day to submit workshop proposal for pre-acceptance
Dec 20, 2024	Workshop acceptance notification

ABSTRACTS

Nov 7, 2024	Call for abstracts (poster/oral presentation) opens
Jan 16, 2025	Last day for posters/oral submission
Mar 3, 2025	Notification abstracts (posters/oral presentation) acceptance

AWARDS

Nov 7, 2024	Call for Trainee Travel Award application opens
Jan 16, 2025	Last day for Trainee Travel Awards application
Mar 3, 2025	Notification Trainee Travel Awards

REGISTRATION

Jan 13, 2025	Registration opens
Apr 2, 2025	Last day to register at early-bird conference rate
May 2, 2025	Last day to register at regular conference rate
Jun 2, 2025	Last day to register at final conference rate

ACCOMMODATIONS

Jan 13, 2025	Accommodation opens
May 2, 2025	Last day to reserve accommodation within guaranteed block period

