BCI Meeting overview

By Dr. Brendan Allison

The 10th International BCI Meeting[1] was successful in many ways. The meeting was well attended by people with interesting backgrounds, ideas, and recent work. Most attendees were surprised to hear that the BCI Society president, Prof. Jennifer Collinger, had to cancel her trip at the last minute due to health reasons, but her absence didn't seem to impact the conference. There weren't any major problems with technology, facilities, utilities, infrastructure, security, scientists behaving badly, etc. Content was novel, interesting, and well-presented. Attendees and organizers were generally amicable and cheerful. The conference venue and surrounding forest were excellent and maintained the retreat-style atmosphere that we had at all prior BCI Meetings.

The BCI Meeting was organized by the non-profit BCI Society, which encourages interaction among disciplines and sectors. The meetings have always been primarily attended by neuroscientists, medical doctors, and different types of engineers (primarily biomedical, electrical, and software), with a smattering of other disciplines. The 10th Meeting saw an increase in this inter-disciplinarity, including experts in linguistics, therapy, ethics, and commercial skills like sales and entrepreneurship. Sectors included academia, government, medical, and non-profit.

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[1] https://bcisociety.org/bci-meeting/

BCI Meeting organizers

The BCI Meeting committee was:

Conference Chair:
Jennifer Collinger University of Pittsburgh, USA

Conference Co-Chair:
Mariska Vansteensel University Medical Center Utrecht, the Netherlands

Scientific Program Committee Chair:
Natalie Mrachacz-Kersting Albert-Ludwigs-Universität Freiburg, Germany

Scientific Program Committee Co-Chair:
Donatella Mattia Fondazione Santa Lucia, Italy

Young Talent Committee Chair:
Davide Valeriani Google, USA

BCI Meeting activities

The 10th International BCI Meeting had a range of academic and social activities.

Academic:

Satellite Events: In addition to Satellite Event 1, the program featured three other Satellite Events. SE2 and SE3 were largely devoted to tutorials for the BCI2000 open-source and some GTEC products, respectively. SE2 was led by Prof. Peter Brunner and Dr. James Swift from the University of Minnesota and SE3 was led by Dr. Christoph Kapeller and Mr. Francisco Fernandes from GTEC. SE4, with "job offers and opportunities workshops," was initially planned a workshop but was changed to a Satellite Event shortly before the meeting.

Workshops: Workshop sessions are often central to academic conferences, and all BCI Meetings have featured them prominently. Attendees proposed workshops months before each meeting, and the meeting committee organized a jury to select the best workshops. Workshops were also chosen to avoid overlap; sometimes, workshop proposers were asked to combine workshop proposals. This BCI Meeting had three workshop sessions with seven workshops each that each lasted three hours. Workshops primarily entailed lectures followed by questions and discussion.

Posters: Posters are also key to conferences like these. Poster submission and jury selection required considerable effort from the organizing committee, with a similar process of selecting a jury that then evaluated the poster submissions. Posters this year had some good and varied content. Many people commented that they had a backlog of work to present since the last in-person BCI Meeting. Several jurors also circulated in the poster session to select the best poster awards.

Classes: This BCI Meeting featured several hands-on tutorials. The afternoon after the Satellite Events contained a BCI Tutorial, BCI Fundamentals Didactic Session, and the first BCI Master Class session. The

next two evenings also had Master Class sessions. At each Master Class, one or two students presented recent work along with a more experienced BCI practitioner, and the audience provided suggestions. Like the workshops, each session had a variety of different classes so attendees could find a class meeting their interests. Each of the three sessions had seven Master Classes.

Individual BCI Awards: June 8 and 9 each featured one-hour lectures from winners of the BCI Society's Individual BCI Awards. The first day featured talks from different Early Career Award winners. The second day's lecture was presented by the winner of the Lifetime Achievement Award, Dr. Jonathan Wolpaw. This lecture was particularly well-attended.

Plenary Lectures: This BCI Meeting had three plenary speakers. Prof. Kübler reviewed her 30 years of work in the field with P300 BCIs (See also Allison, Jin, and Kubler, 2020). In the second plenary talk, Prof. Chang reviewed the very hot topic of speech neuroprostheses. The third plenary talk was given by Prof. Oxley from Synchron about their clinical work with the Stentrode.

Research Sessions: June 8 and 9 each had a two-hour research session with six talks each. These early afternoon workshops provided mechanisms for relatively short talks across various topics. The talks had a good mix of invasive and non-invasive BCIs. The Santa Lucia Foundation had two talk slots since they are a top institute with a lot of new material to present.

Neuroethics Session: Prof. Pim Haselagar led the one-hour neuroethics session at this meeting. He has been active in prior BCI Society meetings, including workshops and surveys, with several good papers involving neuroethics. The neuroethics session also had a panel of four other experts. The session mostly discussed a topic that is common at BCI Meetings: translation to broader user (especially patient) populations. How do we protect users without stifling innovation? Are more regulations needed, and if so, how can we best develop them? Prof. Haselager promoted "constructive neuroethics," meaning that neuroethics should not just tell people what they can't do or how they need to spend money.

Social/Other:

Town Hall: Like most well-organized conferences, the BCI Meeting always has a Town Hall that includes a welcome, overview of the upcoming program, and other announcements. This Town Hall also included brief Memorial Tributes to three BCI experts who passed away in the last few years. These memorials are fairly new at BCI Meetings. The last in-person BCI Meeting in 2018 featured a tribute to Prof. Jacques Vidal, who had recently passed away.

Three lunches with leaders: Prior to the BCI Meeting, attendees could ask to have lunch with a senior conference attendee. Many tables in the dining room had numbers corresponding to a leader, and attendees could sit at the table to ask for connections and advice while gaining visibility. These are excellent mechanisms for interaction among older and younger attendees. If the tables had empty seats, other attendees could sit and join the conversation. More than once, leaders flagged down a colleague who was passing by to provide a warm intro to an attendee at their leader table.

A BCI User Forum: These interactive forums started at the BCI Meeting in 2015, spearheaded by Prof. Jane Huggins. At each forum, different types of patients who use BCIs are available online (or occasionally in person) to interact with attendees. Organizers have tried to find a range of patients with different

conditions, needs, and types of BCIs. For many attendees who haven't worked with patients, these can be a great introduction to the practical challenges of real-world BCI use.

Diversity in BCI Workshop: The last few BCI Meetings have featured workshops with brief talks and discussion to explore ways to increase diversity. Options that are often discussed include targeted outreach to under-represented groups and cost waivers to attend conferences. This meeting's' Diversity in BCI Workshop was led by Louise Wright from Newcastle University. The BCI Society has always been concerned with increasing and respecting diversity within the Society. The BCI Society has a Code of Conduct and has been active in several measures to increase membership and meeting attendance from people in low-income countries.

Exhibitors: The poster room also featured several exhibitor booths. Most booths had their products available for hands-on demonstrations. Like all prior BCI Meetings, the exhibitor room was dominated by manufacturers of EEG products and didn't include "big BCI" companies like Facebook, Neuralink nor Galvani Bioelectronics. One FNIRS manufacturer was present (NIRx), which has been actively trying to penetrate the BCI market for some years.

Funding and Investment Panel: These are also recurring events at BCI Meetings, which have always included some representatives from funding agencies and from industry. These experts give talks in which they present funding mechanisms they manage and/or general advice. Some people attend in the hope of getting inside information about emerging opportunities or just learning about a way to get money that they hadn't considered. The panel this year had three funding experts.

Nonfires: The first and third nights (June 6 and 8) featured outdoor bonfire parties. Each of these parties had a sponsor with ample food and beverages available. They also featured a brief talk from the sponsor and plenty of friendly mingling. They did not feature a bonfire and hence many attendees called them "nonfires." All prior BCI Meetings featured bonfire parties after the other events ended, but this meeting was in an ancient forest.

Movie Night: This BCI Meeting featured the first-ever BCI-fi (BCI Science Fiction) Movie Night, which was in the Canopée room on the second night. Prior to the meeting, we asked members to suggest up to 5 BCI-fi narratives (such as movies or streaming shows) they'd like to see. No single choice got more than two votes. About 30 people attended. A colleague, Prof. Nataliya Kosmyna from MIT, provided a video clip with 35 BCI-fi clips from different movies. She played one or a few clips, then encouraged audience discussion. Although her video clip lasted a little over an hour, we only saw about half of them due to discussion.

BCI Trivia Night: The meeting also featured the second-ever BCI Trivia Night. This event was planned with several rounds of questions across different themes like BCI in Industry, history of BCI, and general BCI. BCI Trivia Night didn't go very well. Only a few people attended and it was decided to cancel it this year.

Dinner and Closing: One of the last events was the closing. The closing featured canonical components including a review of the meeting, announcement of the poster winners, invitation to the next meeting, and some information about transportation home. Many attendees had already left and those that were there seemed happy but tired.

About the Author

Dr. Allison has been active in EEG research for over 20 years, most of which involved brain-computer interface (BCI) systems. He earned his PhD in Cognitive Science in 2003 at UC San Diego, where he focused on BCIs based on visual attention (primarily P300) and imagined movement. He has since worked with several top researchers and institutes, including Prof. Wolpaw at the New York State Dept of Health, Prof. Polich at The Scripps Research Institute, and Profs. Pfurtscheller and Neuper at Graz University of Technology. He returned to his alma mater and is again with the Cognitive Science Dept. at UCSD. He is a Founding Board Member of the BCI Society and editor of the BCI Journal.

Dr. Allison's recent work involves extending BCI technology to help new groups. This includes persons seeking motor rehabilitation after a stroke and persons with disorders of consciousness (DOC). Dr. Allison is very, very well aware of the prevalent belief that BCIs for mainstream users are the wave of the future, and has led many symposia about the topic, and talked to very many businesses with similar dreams and (today) nothing.

Dr. Brendan Allison holds a Ph.D at UC San Diego. He wrote this meeting report as part of the Tianqiao and Chrissy Chen Institute Science Writers Fellowship which aims to extend the conversation beyond the meeting with the hopes of sparking new ideas and collaborations.