



Call for Contributions

Note: *On-site and Virtual Options*

To accommodate many situations, we are offering the option for either physical presence or virtual participation. We would be delighted if all authors managed to attend in person but are aware that special circumstances are best handled by having flexible options.

Submission:

1. **Inform the Chair** about the Title of your Contribution

2. **Submission URL:**

<https://www.iariasubmit.org/conferences/submit/newcontribution.php?event=COGNITIVE+2026+Special>

Please select Track Preference as **BRAINCOMAUG**

Special track

BRAINCOMAUG: Brain Computer Interface for AI Augmented Human Cognition

Chair

Dr. Jayfus T. Doswell, The Juxtopia Group, JUICE-Lab, USA

jayfus@juxtopia.com

along with

COGNITIVE 2026, The 18th International Conference on Advanced Cognitive Technologies and Applications

<https://www.aria.org/conferences2026/COGNITIVE26.html>

April 19-23, 2026 - Lisbon, Portugal



Artificial intelligent (AI) enabled Brain computer interfaces (BCI) have the potential to augment and improve human cognition ranging from implantable neuro-prostheses; repairing parts of the injured brain's hippocampus (i.e., to convert short-term memories into long-term memories); facilitate secret non-verbal communication among teams of peers; and restore active memories to accelerating human learning and skill acquisition with non-invasive neural-engineering and computational brain-to-human neuron mapping. Although advances have been made in BCI for augmenting or improving human cognition, this subset of AI paired with BCI is new and requires continuous and empirical multidisciplinary research to solve challenges so that it may be applied to the real world. The BCI challenges include, but are not limited to, low BCI signal strength; brain complexity; AI data volume &



speed; limited datasets; mental privacy & security; inaccurate signal classification; machine learning of neuronal communication; data segmentation; and noise removal.

Topics include, but not limited to:

- **Advanced Signal Processing & Real-Time Decoding**
 - **Deep Learning Decoders:** Utilizing AI models (e.g., Transformers, Recurrent Neural Networks) to significantly improve the interpretation of complex, noisy, and non-stationary neural signals in real-time, allowing for smoother and more precise control of devices.
 - **Speech and Thought Translation:** AI is enabling the direct, real-time translation of neural activity into synthesized text or speech for individuals with ALS or stroke-induced paralysis, with some systems achieving over 60 words per minute.
 - **Mind-to-Image/Thought Reconstruction:** AI models trained on fMRI or ECoG data are being used to extract and reconstruct images or thoughts that people imagine, translating mental concepts into visual outputs.
- **Improved Hardware Integration and Autonomy**
 - **Miniaturized Processors:** Integrating advanced AI processors directly into implantable devices or wearable hardware (edge AI), which reduces latency and enhances real-time performance for prosthetics and communication.
 - **High-Channel Count and High-Resolution:** Advanced AI can process data from massive, ultra-high-resolution, and flexible implants.
 - **Wireless, Non- Invasive:** Advances in AI allow smaller, wireless sensors to deliver high-quality signals without needing open-brain surgery.
- **Adaptive and Personalized AI**
 - **Adaptive Calibration:** AI models can continuously adapt to the changing nature of brain signals over time, eliminating the need for long, daily recalibration sessions.
- **Novel Functional Applications**
 - **Bidirectional Control and Sensory Feedback:** AI helps manage closed-loop systems, translating artificial sensor data from a prosthetic limb into neural stimulation (ICMS) that allows amputees to feel sensations like pressure and texture.
 - **Advanced Neuroprosthetics:** AI enables highly complex, multi-fingered, and coordinated robotic limb movements that mimic natural, human-like motion.
 - **Mental Health and Neurofeedback:** AI-driven non-invasive devices (e.g., in headphones or headbands) are being developed to monitor and improve focus, manage stress, and treat conditions like PTSD and depression through real-time neurofeedback.
 - **Simulated Realities and Dreamscapes:** Emerging technologies aim to use AI to read and stimulate the brain to induce or record lucid dreams and create, fully immersive virtual reality experiences.
- **Security & Ethics**
 - **Ethical, legal, & social challenges (ELSI):** BCI Advancements are driving significant ethical, security, and privacy considerations, particularly regarding "neuro-rights" and the protection of, and access to, personal, unconscious thought data.



- **Future Possibilities**

- **Neural Telepathy:** Enabling direct brain-to-brain communication, where thoughts or emotions are transferred directly between individuals.
- **Memory Extension:** Exploring the potential for AI to aid in the extraction, storage, and retrieval of memories directly from the brain.
- **Cognitive Augmentation:** Enhancing human memory, focus, and learning speeds, effectively "reprogramming" or optimizing brain function.

Important Datelines

Submission: Feb 28

Notification: Mar 20

Registration: Apr 2

Camera-ready: Apr 2

Contribution Types

- Regular papers [in the proceedings, digital library]
- Short papers (work in progress) [in the proceedings, digital library]
- Posters: two pages [in the proceedings, digital library]
- Posters: slide only [slide-deck posted on www.aria.org]
- Presentations: slide only [slide-deck posted on www.aria.org]
- Demos: two pages [posted on www.aria.org]

Paper Format

- See: <http://www.aria.org/format.html>
- Before submission, please check and comply with the editorial rules: <http://www.aria.org/editorialrules.html>

Publications

- Extended versions of selected papers will be published in IARIA Journals: <http://www.ariajournals.org>
- Print proceedings will be available via Curran Associates, Inc.: <http://www.proceedings.com/9769.html>
- Articles will be archived in the free access ThinkMind Digital Library: <http://www.thinkmind.org>

Paper Submission

<https://www.ariasubmit.org/conferences/submit/newcontribution.php?event=COGNITIVE+2026+Special>

Please select Track Preference as **BRAINCOMAUG**

Registration

- Each accepted paper needs at least one full registration, before the camera-ready manuscript can be included in the proceedings.
- Registration fees are available at <http://www.aria.org/registration.html>

Contact

Chair: Dr. Jayfus T. Doswell, jayfus@juxtapia.com

Logistics (Steve McGuire): steve@aria.org