

**THE BRAIN AND THE CHIP 2024
WORLD RESEARCH CONGRESS PROGRAM SCHEDULE**

Meeting venue (refer to the map at the end):

University Miguel Hernandez
Edificio INNOVA
Avda de la Universidad, s/n
Elche, Alicante (Spain)

MONDAY, NOVEMBER 11, 2024

(Presentations are 20-minutes long, plus a 10-minute Q & A – Challenge period)

8:30 - 9:00 am **WALK-IN AND REGISTRATION**

9:00 - 9:30 am **WELCOME & INTRODUCTION**
Academic authorities

Session One: Advanced Sensory-Motor prostheses

Moderator: Richard van Wezel, Ph.D., Radboud University, Nijmegen, the Netherlands

9:30 – 10:00 am **Brain Machine Interfaces: the development and design of therapeutic devices**
David Bjanec, Ph.D., California Institute of Technology, California

10:00 - 10:30 am **Sensory restoration for improved motor control of prostheses**
Robert Gaunt, Ph.D., University of Pittsburgh, Pennsylvania

10:30 – 11:00 am **Expanding the repertoire of artificial touch: local geometric features via patterned microstimulation of human S1**
Giacomo Valle, Ph.D., Chalmers University of technology, Gothenburg, Sweden

11:00 - 11:30 pm BREAK

Session Two: Cognitive Prostheses

Moderator: Pieter Roelfsema, M.D. and Ph.D., Netherlands Institute Neuroscience, Amsterdam

11:30 - 12:00 pm **Cognitive Neuroprosthetics: Comparisons of posterior parietal and motor cortex activity in humans**
Richard Andersen, Ph.D., California Institute of Technology, California

12:00 - 12:30 pm **Biasing perception through electrical stimulation in the human temporal lobe**
Florian Mormann, M.D. and Ph.D., University Bonn, Germany

12:30 – 1:00 pm **Brain-controlled navigation in a virtual 3D environment**
Peter Janssen, M.D., Ph.D., KU Leuven, Leuven, Belgium

1:00 - 1:30 pm **Deep reinforcement learning for evaluation and optimization of prosthetic vision**
Richard van Wezel, Ph.D., Radboud University, Nijmegen, the Netherlands

1:30 - 3:00 pm LUNCH

Session Three: Brain plasticity, other cortical implants and retinal implants

Moderator: Juan Antonio Barcia, M.D., Ph.D., Hospital Clínico San Carlos, Madrid, Spain

- 3:00 – 3:30 pm **Engineering Brain connectivity patterns for therapeutics**
Yanik Mehmet Fatih, Ph.D., Swiss Federal Institute of Technology (ETH), Zurich, Switzerland.
- 3:30 – 4:00 pm **How multisensory integration, neuroplasticity and AI can help improve performance and Integration of brain implants**
Amir Amedi, Ph.D., Reichman University, Tel Aviv, Israel
- 4:00 – 4:30 pm **Neuromodulation-induced cortical prehabilitation**
Jose María Tormos, M.D., Ph.D., Universidad Católica de Valencia, Valencia, Spain
- 4:30 - 5:00 pm BREAK
- 5:00 – 5:30 pm **12-months results after implantation of the PRIMA subretinal microchip for the treatment of GA**
Andrea Cusumano, M.D., Ph.D., University Rome Tor Vergata, Rome, Italy
- 5:30 – 6:00 pm **Towards auditory cortical implants for hearing impaired**
Brice Bathellier, Ph.D., French National Centre for Scientific Research (CNRS), Paris, France
- 6:00 – 7:00 pm **QUICKFIRE POSTER PRESENTATIONS**

“The Brain’s Symphony”:

- 9:00- 10:30 pm. **The Brain’s Symphony. We invite you to the magic of the Brain’s Symphony, a unique concert where Music, Science and Art will come together. Join us at the Gran Teatro in Elche for an unforgettable evening that bridges creativity and discovery (open to the public).**

TUESDAY, NOVEMBER 12, 2024

(Presentations are 20-minutes long, plus a 10-minute Q & A – Challenge period)

Session Four: Bridging the gap: End user perspectives

Moderator: Journalist to be determined

- 9:00 - 10:00 am. **Round-table.** Participants: Scott Imbrie, Chicago, Illinois (USA); David Sánchez, President Federation of Association for Hereditary Retinal Dystrophies (Spain); Representant of the Spanish National Organization for the Blind.

Session Five: Beyond the retina

Moderator: Andrea Cusumano, M.D., Ph.D., University Rome Tor Vergata, Rome, Italy

- 10:00 – 10:30 am **Characterizing visual neurons beyond classical parametric stimuli using deep digital twins**
Fabian Sinz, Ph.D., Georg-August-University Göttingen, Göttingen, Germany
- 10:30 – 11:00 am **Reconstructing and disrupting the neurodynamic basis of real word vision**
Avniel Ghuman, Ph.D., University of Pittsburgh, Pittsburgh, Pennsylvania
- 11:00 – 11:30 am **A 1024-channel Utah-array based visual prostheses in NHPs**
Xing Chen, Ph.D., University of Pittsburgh, Pittsburgh, Pennsylvania

11:30 – 12:00 am BREAK

Session Six: Visual prostheses: Clinical trials I

Moderator: Avi Caspi, Ph.D., Jerusalem College of Technology, Jerusalem, Israel

12:00 – 12:30 pm **Lessons learned and challenges remaining for developing functional visual cortical prostheses**
Denise Oswald, Ph.D., University of Pennsylvania, Philadelphia, Pennsylvania

12:30 – 1:00 pm **Restoration of visual consciousness in people who are blind**
Pieter Roelfsema, M.D. and Ph.D., Netherlands Institute Neuroscience, Amsterdam.

1:00 – 1:30 pm **Extended periodic idling of camera-based stimulation improves grating-acuity task performance with the Intracortical Visual Prosthesis (ICVP)**
Michael Barry, Ph.D., Illinois Institute of Technology, Chicago, Illinois.

1:30 - 3:00 pm Lunch

Session Seven: Visual prostheses: Clinical trials II

Moderator: Patrick Degenaar, Ph.D., Newcastle University, Newcastle upon Tyne, UK

3:00 – 3:30 pm **The characteristics of visual perceptions induced by intracortical electrical stimulation in blind individuals**
Leili Soo, Ph.D., University Miguel Hernandez, Elche, Spain

3:30 – 4:00 pm **Exploring neural correlates of visual perception for enhanced bidirectional cortical visual prostheses design**
Fabrizio Grani, Ph.D., University Miguel Hernandez, Elche, Spain

4:00 – 4:30 pm **Control of electrically evoked neural activity via deep neural networks in human visual cortex**
Jacob Granley & Pehuen Moure, UC Santa Barbara, California and Swiss Federal Institute of Technology (ETH), Zurich, Switzerland

4:30 - 5:00 pm. BREAK

Session Eighth: Neuroethics

Moderator: Ione Fine, Ph.D., University of Washington & University of Leeds, Seattle and Leeds.

5:00 – 5:30 pm **Researchers' Neuroethical Perspectives on Brain-Based Visual Prostheses: Psychosocial Impacts, Post-Trial Access, Public Attitudes, and Enhancement Potential**
Peter Zuk, Ph.D., University of Texas at Arlington, Arlington, TX

5:30 – 6:00 pm **The future human in the age of AI: Re-thinking super-technology, trans-humanism, and post-truth**
Alex Gomez, Ph.D., Institute of Neuroscience, Alicante, Spain

6:00 – 6:30 pm **Neurotechnology and neurorights**
Rafael Yuste, M.D. and Ph.D., University Columbia, New York.

6:30 – 7:30 pm **POSTER PRESENTATIONS**

WEDNESDAY, November 13, 2024

(Presentations are 20-minutes long, plus a 10-minute Q & A – Challenge period)

Session Nine: Visionary ventures

Moderator: Ra'anan Gefen, Ph.D., CortiSight Medical Ltd, Israel

- 9:00 – 9:30 am **Neuralink visual prosthesis**
Daniel Adams, Ph.D., Neuralink, Fremont, California
- 9:30 – 10:00 am **ReVision implant: developing a high resolution cortical visual prosthesis**
Frederik Ceyssens, Ph.D., ReVision Implant N.V., Amsterdam, the Netherlands
- 10:00 – 10:30 am **Innovations in vision restoration through LGN targeted prosthesis**
Bert Monna, Ph.D., Phosphoenix B.V., Amsterdam, the Netherlands
- 10:30 -11:00 am. BREAK

Session Ten: New technologies for cortical prosthetic vision (I)

Moderator: Leili Soo, Ph.D., University Miguel Hernandez, Elche, Spain

- 11:00 – 11:30 pm **Stimulation of visual cortex in humans**
Daniel Yoshor, M.D. and Ph.D., University of Pennsylvania, Philadelphia, Pennsylvania
- 11:30 – 12:00 pm **Event-based sensor enables high-speed, low-latency, wearable eye tracker for cortical visual prostheses**
Avi Caspi, Ph.D., Jerusalem College of Technology, Jerusalem, Israel

Session Eleven: New technologies to stimulate and modulate brain activity

Moderator: Julio Albisua, M.D., Ph.D., Hospital Universitario Fundación Jiménez Díaz, Madrid, Spain

- 12:00 – 12:30 pm **Surgery in and around the visual pathways: the eye doesn't see what the brain doesn't know**
Pablo Gonzalez, M.D. Ph.D., Hospital General Universitari Alicante, Alicante, Spain
- 12:30 – 1:00 pm **Closed loop communication with the visual cortex**
Patrick Degenaar, Ph.D., Newcastle University, Newcastle upon Tyne, UK
- 1:00 – 1:30 pm **Deep brain stimulation**
Rafael García de Sola, M.D. Ph.D., Director of the UAM Chair "Innovation in Neurosurgery"
Autonomous University of Madrid. Madrid, Spain
- 1:30 - 2:30 pm. Lunch

Session Twelve: New technologies for cortical prosthetic vision (II)

Moderator: Peter Janssen, M.D., Ph.D., KU Leuven, Leuven, Belgium

- 2:30 – 3:00pm **Neuromorphic sensors and processors for prosthesis**
Shih-Chii Liu, Ph.D., Institute of Neuroinformatics, University of Zurich & ETH Zurich, Switzerland
- 3:00 – 3:30 pm **I-See: improving intra-cortical visual prostheses through complex coding and integration of Spontaneous states**
Udo Ernst & David Rotermund, Ph.Ds., University Bremen, Bremen, Germany

3:30 – 4:00 pm **Talking to the brain in its own language: decoding functional representation in V1 from Spontaneous activity**
Jan Antolik, Ph.D., Charles University, Prague, Czechia

4:00 - 4:30 pm BREAK

Session Thirteen: New technologies for cortical prosthetic vision (III)

Moderator: Amir Amedi, Ph.D., Reichman University, Tel Aviv, Israel

4:30 – 5:00 pm **Pulse trains to percepts: How virtual patients can be used to describe the perceptual effects of human visual cortex stimulation**
Ione Fine, Ph.D., University of Washington & University of Leeds, Seattle and Leeds.

5:00 – 5:30 pm **Design lessons for next-generation cortical implants**
Antonio Lozano, Ph.D., Netherlands Institute Neuroscience, Amsterdam, Netherlands

Session Fourteen: Group discussion

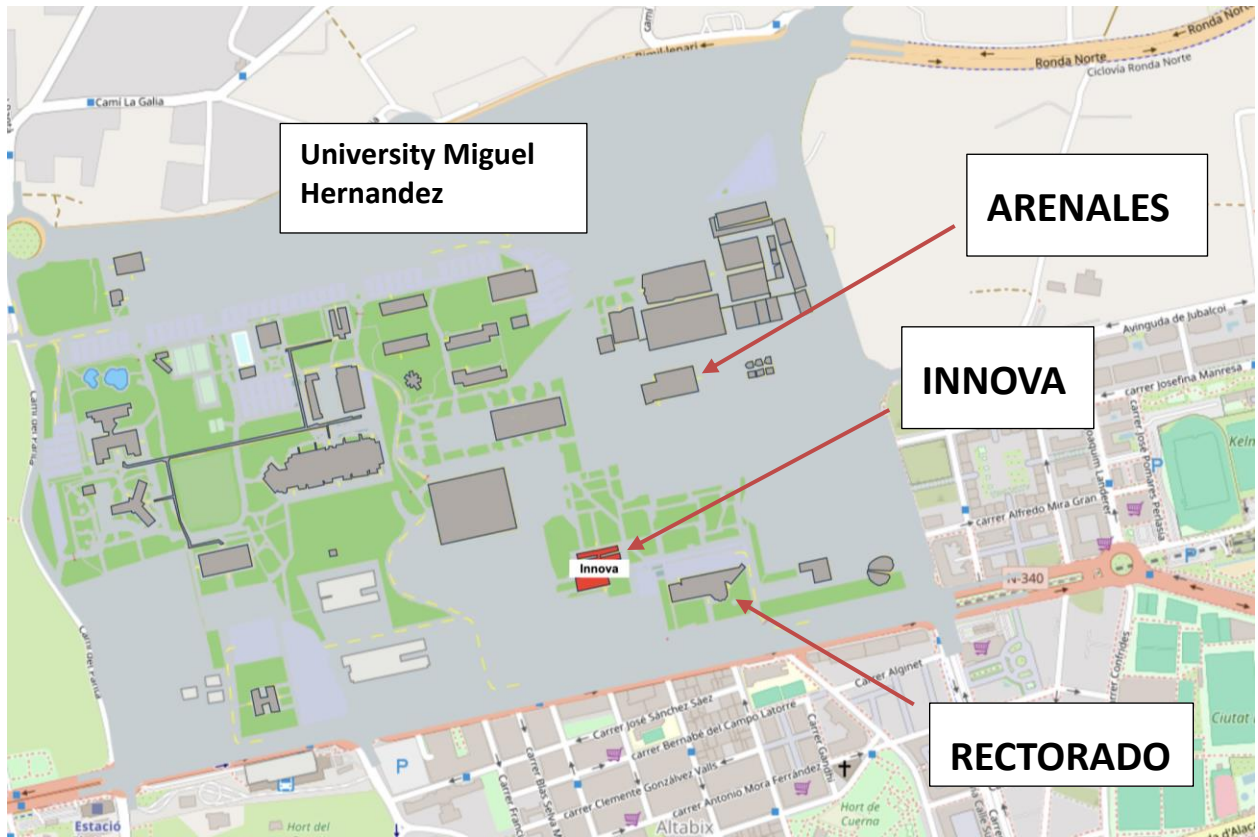
Moderator: Eduardo Fernandez, M.D., Ph.D., University Miguel Hernandez, Spain

5:30 – 6:00 pm **Group Discussion & End Meeting**

Avda de la Universidad, s/n Elche, (Alicante)

Meeting venue:
Edificio INNOVA

Lunch places:
Arenales Building and Rectorado
Both places will offer you an affordable menu.



Ajuntament d'Elx