“Seminars in Biomedical Engineering”

Programa de Pós–Graduação em Engenharia Biomédica

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YouTube Link: https://youtu.be/JgoDtXwpMpM

REAL TIME PHASE CONTRAST MRI: A NOVEL SCOPE INTO CEREBROVASCULAR FLOWS AND THEIR VARIABILITY

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Abstract

Blood flows to and from, or inside, the intracranial compartment are major physiological variables, together with the displacement flows of the cerebrospinal fluid (CSF). The webinar will show preliminary results of a new MRI sequence, real-time phase-contrast MRI (RT-PC-MRI), which permits to access body fluid flows quantitatively and non-invasively with sufficient time resolution to capture pulse waves and their slower modulations due to respiration and Mayer waves. These mechanisms are observed in the internal carotid arteries, internal jugular veins, CSF at high cervical level and in the superior sagittal sinus.

The presentation will shortly introduce basic principles of MRI imaging and its application to fluid velocity sensing by phase-contrast. Tutorial elements will be also added relevant to basic cardiovascular regulation principles connected to the observed data.

Speaker's Bio

Prof. Giuseppe Baselli (Milano, Italy 1958) obtained his MSc degree in Electrical Engineering, Bioengineering track, in 1983 at the Politecnico di Milano, cum laude. Since 2001 he is full professor in Bioengineering at the same university. He was director of the Biomedical Engineering program (2004–2009) and of the Department of Bioengineering (2010–12), member of the Academic Senate (2011–12), coordinator of the Bioengineering Section of the new Department of Electronics, Information and Bioengineering (DEIB, 2013–15). Fellow EAMBES (since 2019). He teaches a course on Bioengineering for Physiological Control Systems and one on Methods for Biomedical Images. He is coauthor of more than 170 journal papers. His research interests are in the field of biomedical data, signal, and image processing by linear or non-linear modelling and artificial intelligence methods. Namely, he addressed cardiovascular regulation, image reconstruction in oncology, molecular imaging, neuroimaging including functional and anatomical connectivity, cerebrovascular regulation and morphology.