

FOR TECHNICAL REPRESENTATIVE
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YASIN DHAHER (M'19) Dr. Yasin Dhaher is the R. Wofford Cain Distinguished Chair in Bone and Joint Disease Research, the Vice Chair of Research for the Departments of Physical Medicine and Rehabilitation (PMR) and Orthopaedic Surgery, Professor of Bioengineering, Director of the Biomaterials and Tissue Engineering track at the Bioengineering Department & Member of the O'Donnell Brain Institute at UT Southwestern Medical Center, Dallas TX.

Prior to joining UTSW, Dr. Dhaher was a Professor of Biomedical Engineering Department and Physical Medicine and Rehabilitation at Northwestern University in Chicago IL.

The central theme of his research is to understand the basic neurophysiological properties of the lower limb after a neurological lesion. The primary goal of these investigations is to evaluate and improve rehabilitation interventions after neurological disabilities. In addition to focusing on the basic science related to these pathologies, his research has also often expanded to include treatment interventions (robotic rehabilitations, etc...) for these diseases. Dr. Dhaher published more than 120 papers in peer reviewed journals and conference proceedings and gave more than 40 invited talks.

Dr. Dhaher served on a number of grant review panels, including the MRS study section, National Institutes of Health (a standing member); MSM review panel, NIBIB & NIAMS special emphasis panels; DARPA; and the Thiel Foundation. Dr. Dhaher served as the Associate Editor for the *IEEE Transactions on Biomedical Engineering* and an Associate Editor/Editor for the Annual International Conference of the IEEE Engineering in Medicine and Biology Society and serves on the International Conference of Rehabilitation Robotics steering committee.

Position Statement: Bridging the Divide between the Two Cultures: Engineering and Medicine my goal in seeking the AdCom membership is to address, in my view, a significant biomedical engineering problem of competing priorities that engineers and clinicians face when evaluating the usefulness of a new technique or technology. Engineers focus on how to get a machine/instrument to work safely and consistently and how to make algorithms robust and accurate. Clinicians focus on how to use a device or an algorithm to best solve a patient's problem. My focus is to present these often conflicting points of view and engage in discussions on how to bring about common goals when technology and engineering tools is undergoing development. One approach to achieve this goal is to establish a unique theme within the EMBC annual meeting that focuses on this platform. In addition, I will solicit contributions from EMBS members to webinars that present key underpinnings of achieving successful interactions and present successful examples. In the context of rehabilitation robotics, my own interest, a webinar, for example, would present the importance of using clinical trials to establish the success of robotics in establishing efficacy for important patient outcomes. By the end of the exposure, viewer will be able to reflect on the different elements that might be in place to assure success of any emerging robotic technology project in addressing the needs of clinicians and, thus, improving the chances the technology will serve a useful function for rehabilitation plans of care.



CARLOTTA GUIDUCCI (M'09-SM'16) is associate professor of Bioengineering and Electrical Engineering at the Swiss Federal Institute of Technology in Lausanne, Switzerland. She received the Ph.D. degree in Electrical Engineering from University of Bologna (I). Her most prominent achievements as graduate and postgraduate student have been the demonstration of the quantification of DNA hybridization via changes of electrodes interface capacitance, and the development of the first fully-integrated CMOS chips featuring arrays based on this sensing approach. As a PI at EPFL, her research has focused on the integration and the interfacing issues of lab-on-chip devices. Her most significant achievements include two lab-on-chip/CMOS integration solutions and a novel technology for microfluidic-embedded microsensors that represent unique and highly exploitable technologies. Her lab developed functional electronic systems to support the monitoring of medical therapies and to allow the characterization of cellular samples at the single-cell level.

Carlotta Guiducci was a recipient of the 2013 Intel Early Career Faculty Honor Program Award and the coordinator of a national Swiss consortium on Therapeutic Drug Monitoring (Nano-tera.ch).

Position Statement: I am professor in Bioengineering and Electrical Engineering at the Swiss Federal Institute of Technology in Lausanne, Switzerland. I hold my position as a professor since 2009 and I am a tenured faculty member since 2018.

Let me address three main points to present why I think the EMB Society could benefit of having me in a decision-making position.

My experience as a former tenure-track faculty

Only few institutions in Europe - and only since very recently - have established a tenure track system for the recruitment of junior professors. The Swiss federal institute of technology has this in place since approximately 15 years. EPFL is an extremely international environment with many colleagues coming from the US system. The best practices of the tenure-track processes have been brought along by such new resources, on topics such as the selection process, the independence of candidates and their mentoring. Europe remains substantially different from the US in terms of research environment (e.g. scale of institutions), ways to get visibility and network, funding of research. I believe to have gained a unique experience as a former tenure-track faculty in a top-tiers university in Europe and I could help

the Society to support its junior PI members located here who are striving to get promoted in newly established, and maybe slightly undefined, selection systems.

Interdisciplinarity and clinical Translation

I am an EE graduate from the University of Bologna (I). Since my diploma in 2001, I moved progressively towards biomedical engineering, committing to projects to advance the state-of-the art of molecular analytics, first, and later of other fields of bioanalytics. My core competences as an engineer are now in microfabrication and design of hybrid systems, while I conceive my work based on the needs of the fields of diagnostics and bioanalytics-biomonitoring systems.

In the course of my research activity, and in particular as a principal investigator, I had multiple opportunities to collaborate with medical doctors in different fields of analytics and sample elaboration. I learned how to leverage complementary competences and to improve communication, while setting common goals. Let me briefly describe some of the activities my lab has been carrying out with the clinics.

(i) My lab has a long-standing collaboration with the Department of Clinical Pharmacology and Toxicology at CHUV (University Hospital in Lausanne) in a common effort towards supporting and extending the employment of individualized therapies based on drug monitoring. Our team developed a new highly compact technique to quantify drug concentration in patients' blood samples and we have

(ii) We have established as well a collaboration with the Ludwig Cancer Center of Lausanne, aiming at the development of novel technologies for the advancement of T-cell based cancer immunotherapy. The team led by Prof. Coukos is a major player in the domain and has extensively contributed to the definition of novel approaches in personalized immunotherapy. Our collaboration stemmed from their interests in streamlining cell-based treatment and our focus on application-driven solutions for the clinics.

(iii) In close collaboration with medical experts from the Clinique Universitaire de Médecine Dentaire de Genève (CUMD) and Le Centre d'investigation et de recherche sur le sommeil (CIRS) at CHUV we are building a miniaturized embedded electronic system for continuous and seamless monitoring of bruxism. This project led to the creation of a company (Aesyra SPA) by two of my former postdocs.

My involvement in such projects of interest for the clinics has been crucial to form my profile of head scientist and engineer committed to technological innovation and, with equal strength, to a relevant outcome for the field of medicine. I am eager to bring my experience of fruitful translation of technology to the clinics to the Administrative Committee of the Engineering in Medicine and Biology Society.

Commitment as female faculty member

My chair has been co-funded by a private foundation in a call to hire a female engineer, the first case at EPFL. I would be happy to support and encourage similar initiatives in Europe and elsewhere, my experience being extremely positive and never suffering from any stigma given the peculiar conditions of my hiring. Although the biomedical engineering field suffers much less than other STEM disciplines of a heavy unbalance in the number of female and men professors, the socalled "leaky pipeline" is nevertheless very substantial and the proportion of female faculty does not at all reflect the one in undergraduate studies. Many possible actions can be put in place. In my institution, I have been active since many years in the seizing of the problem and in the identification of possible actions. For instance, I have contributed to recruitment-related actions, the establishment of transparency in the allocation of resources, of unconscious bias mandatory courses for committees, young female scientists mentoring and dedicated events, and so on. The School of Engineering at EPFL became in the last 10 years a virtuous example among top universities, with one of the higher percentage of women professors in the world, thanks to the commitment of our leaders and the establishment of good practices and proactive approaches.

In conclusion, if given the chance, I would enthusiastically participate to the AdCom activities in the above-mentioned areas and others I could contribute to. I am the head of my laboratory and such a commitment is compatible with my duties and relevant in my academic activity as a whole.



MARIUS GEORGE LINGURARU (M'15-SM'18) DPHIL MA MSC loves working with multidisciplinary teams of clinicians, scientists and engineers to help children grow healthy and happy. He is Principal Investigator in the Sheikh Zayed Institute for Pediatric Surgical Innovation at Children's National Health System in Washington, DC, where he founded and directs the Precision Medical Imaging Group. Dr. Linguraru is also Associate Professor of Radiology and Pediatrics and Secondary Professor of Biomedical Engineering at George Washington University. He co-founded PediaMetrix LLC, a company focused on infant well-being by creating solutions to improve the management of conditions of early childhood. He joined the Sheikh Zayed Institute from the National Institutes of

Health Clinical Center, where he maintains an appointment as Associate Investigator. He completed his doctorate at the University of Oxford and holds master's degrees in science and in arts from the University of Sibiu. He held fellowships at the French National Institute of Research in Computer Science and at Harvard University.

Dr. Linguraru served as Distinguished Lecturer and Chair of the Technical Committee on Biomedical Imaging and Image Processing of the IEEE Engineering in Medicine and Biology Society. He is also a member of the Technical Directors Board Committee of the IEEE Signal Processing Society. He is the recipient of numerous awards, including a prize for Excellence in Engineering at the Houses of Parliament in London, UK. He is the General Chair of the IEEE International Symposium on Biomedical Imaging 2019 in Venice, Italy.

Position Statement: Although Imaging is the central focus of my technical work, I am also deeply engaged with artificial intelligence in healthcare, challenges and opportunities in pediatric health, and clinical translations. I strive to improve the care of common diseases that can benefit from engineering and technology, but I am also working to make progress on rare conditions that also impact our society, such as genetic disorders, and those that affect children. I would like to increase awareness and identify opportunities in these areas that have been little explored at EMBS, and liaise with the leadership of organizations such as the National Organization of Rare Diseases (NORD) in the US, EURORDIS in Europe, and the Global Commission—a partnership Microsoft-Takeda-EUROORDIS.

I will continue to build bridges between EMBS and multi-disciplinary and multi-cultural organizations. The leadership of the European Society of Medical Imaging Informatics (EuSoMII) will attend ISBI 2019 to engage in discussions about artificial intelligence in radiology. The Board of Directors of the Foundation of the International Society of Medical Information Processing and Analysis (SIPAIM) will also be at ISBI to renew its interest in co-organizing summer schools and conferences in Latin America with EMBS. ISBI 2019 will also be the venue of the meeting of the IEEE SPS Board of Governors. I will also leverage my connection with industrial partners--many of which contributed to sponsoring ISBI 2019--to continue to support EMBS activities.

Professional societies face new challenges when it comes to attracting young members. Fast-paced technological and professional developments have created a significant generational gap. Young EMBS engineers and scientists must learn how to deal with technical matters of artificial intelligence as well the practical details of clinical work. My experience has allowed me to become a skilled “translator” of technical, clinical and machine languages, which I plan to use to engage new membership. Through my service to EMBS and occasional attendance of the AdCom meetings, I also learned to appreciate the goals, values and operation of the Society. I would be honored to continue to serve EMBS as AdCom Technical Representative. If elected, I will dedicate time and effort to grow the excellence of service that EMBS provides to the society.



JULIA A. SCHNABEL (M'04-SM'14) is Professor of Computational Imaging at the School of Biomedical Engineering and Imaging Sciences at King's College London. She joined King's in 2015 from the University of Oxford, where she held the post as Associate Professor in Engineering Science (Medical Imaging), and Fellow of Engineering at St. Hilda's College, Oxford, from 2007-15. In 2014 she became Professor of Engineering Science by Recognition of Distinction. She previously held post-doctoral positions at University College London, King's College London and University Medical Center Utrecht. Her research is focusing on machine/deep learning, nonlinear motion modelling, as well as multi-modality, dynamic and quantitative imaging for medical imaging applications, with particular focus on developing methods for correcting complex types of motion, such as sliding organs, fetal movements, and imaging artefacts. Julia has supervised over 45 PhD students and postdocs, and is the director of a Centre for Doctoral Training in Smart Medical Imaging, run jointly between King's and Imperial College London. She is an Associate Editor of *IEEE Transactions on Medical Imaging*, *Transactions on Biomedical Engineering*, a member of the Editorial Board of Medical Image Analysis, and a referee or area chair for numerous international medical imaging and computer vision conferences. She is a Director of the Medical Imaging Summer School (MISS) held biennially in Favignana (Sicily), and has been Program Chair of MICCAI 2018. She was General Chair of WBIR 2016 and will be General Co-Chair of IPMI 2021. She has been serving on the IEEE EMBS Administrative Committee (2017-19), the MICCAI Society Board (2017-20) and the Inria Scientific Board (2017-19). In 2018, Julia has been elected Fellow of the MICCAI Society “For contributions to multiple areas of medical image computing, and for distinguished service to the MICCAI conference and Society”.

Position Statement: As a current EMBS Technical Representative to the Administrative Committee, and member of the IEEE EMBS Technical Committee on Biomedical Image and Image Processing (BIIP), I am already actively involved in various important aspects of EMBS. My most recent EMBS AdComm activities include the successful search for and appointment of a new Editor-in-Chief for *TBME*, nominations and selection of various EMBS awards for Best Chapters and Achievement Awards, as well as advising and liaising on student activities at EMBC. I am Associate Editor of the EMBS flagship journal, *IEEE Transactions on Biomedical Engineering*, and am regularly an Associate Editor or part of the scientific review committee of two of the key conferences associated with EMBS, ISBI and EMBC. Over my career I have actively contributed to raising the profile and visibility of women in STEM subjects, helping to coordinate career sessions for early career researchers, and acting as a mentor. I am also a fervent supporter of the graduate student community, with active contributions to doctoral training and international summer schools in medical imaging.

I am honoured to have been nominated for re-election as an EMBS Technical Representative to the Administrative Committee, which I would be looking forward to continue advising in developing policies that would further advance the field and raise its international profile, as well as support and nurture new or underrepresented research talent working at the interdisciplinary interface of engineering/computing and medicine.