

# ***Diffuse Optical Spectroscopy and Imaging VII***

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*Editors*

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## Introduction

The 2019 European Conferences on Biomedical Optics were held in Munich from June 23<sup>rd</sup> – 27<sup>th</sup>. The Diffuse Optical Spectroscopy and Imaging conference has continued to grow in the last decade and attracted over 105 submissions in 2019. This resulted in over 55 oral and 50 poster presentations from a range of international research groups, showing the significance of this conference for scientific exchange in this field in Europe and worldwide.

We have seen an enormous amount of development in Diffuse Optical Spectroscopy and Imaging, ranging from system development and testing to data analysis and advanced clinical applications. A major development seen in systems and technologies presented at this conference has been towards miniaturisation and wearable systems, both for continuous-wave spectroscopic and time-domain instrumentation. This enables new applications in complex real-life environments, such as comfortable measurements on young children or measurements during exercise in adults.

As diffuse optics technology has developed and our understanding of signal origins has improved, the use of multi-modality systems has also increased. Exciting work was presented to demonstrate that the use of broadband spectroscopic data together with diffuse correlation spectroscopy allows unique measurements of metabolism from the human brain to be obtained. The combination of optical and other technologies, such as ultrasound, was also prominent at the conference tackling important clinical problems such as detecting and characterising thyroid cancer.

Human brain health has remained a significant topic of research within the conference and many excellent contributions seeking a better understanding of brain health and identifying disease and trauma were presented. A look at these proceedings will show that the use of diffuse optics, being either through measurement of haemodynamic changes, oxygenation, or blood flow within humans is an active area of research. Many groups demonstrated validation of these measurements with current gold-standard techniques.

As system development has advanced, the community is becoming more aware regarding performance assessment and validation of instrumentation and data analysis. For the first time, we had two dedicated sessions to Phantoms and Standardisation as well as Open-Source Software which highlighted the importance of sharing knowledge in both areas.

This also included impressive work highlighting the importance of not only making well-characterized phantoms for system validation, but also of further developing them as a relevant factor in international standardisation.

We are very excited to share these proceedings with the community and thank all contributors. We are confident that as the community grows, the importance and applications of diffuse optical imaging and spectroscopy will also continue to grow. We are looking forward to our next meeting in 2021.

**Hamid Deghani**  
**Heidrun Wabnitz**