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Information Systems and Neuroscience

Gmunden Retreat on NeuroIS 2017

 Springer

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Preface

NeuroIS is a field in Information Systems (IS) that makes use of neuroscience and neurophysiological tools and knowledge to better understand the development, adoption, and impact of information and communication technologies. The *Gmunden Retreat on NeuroIS* is a leading academic conference for presenting research and development projects at the nexus of IS and neurobiology (see <http://www.neurois.org/>). This annual conference has the objective to promote the successful development of the NeuroIS field. The conference activities are primarily delivered by and for academics, though works often have a professional orientation.

The conference is taking place in Gmunden, Austria, a much frequented health and summer resort providing an inspiring environment for the retreat. In 2009, the inaugural conference was organized. Established on an annual basis, further conferences took place from 2010–2016. The genesis of NeuroIS took place in 2007. Since then, the NeuroIS community has grown steadily. Scholars are looking for academic platforms to exchange their ideas and discuss their studies. The *Gmunden Retreat on NeuroIS* seeks to stimulate these discussions. The conference is best characterized by its “workshop atmosphere.” Specifically, the organizing committee welcomes not only completed research, but also work in progress. A major goal is to provide feedback for scholars to advance research papers, which then, ultimately, have the potential to result in high-quality journal publications.

This year is the third time that we publish the proceedings in the form of an edited volume. A total of 24 research papers are published in this volume, and we observe diversity in topics, theories, methods, and tools of the contributions in this book. The 2017 keynote presentation entitled “Why do we need animals to understand the neurobiology of economic decision-making?” was given by Tobias Kalenscher, professor of comparative psychology at the University of Düsseldorf, Germany. Moreover, we invited the EEG and brain-computer interfacing expert Gernot Müller-Putz, Graz University of Technology, Austria, to give a “hot topic talk” entitled “The Power of EEG: From Single Channel to High Resolution Derivations”. Moreover, a panel entitled “NeuroIS 2007–2017: Hot Topics and the Future of NeuroIS” was held. Altogether, we are happy to see the ongoing progress

in the NeuroIS field. More and more IS researchers and practitioners have been recognizing the enormous potential of neuroscience tools and knowledge.

Lubbock, USA
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Montreal, Canada
Kennesaw, USA
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Tobias Kalenscher—Keynote

Why do we need animals to understand the neurobiology of economic decision-making?

Despite the still frequently made assumption that humans are rational, consistent, sophisticated and selfish decision-makers, decades of research in the behavioral sciences suggests that individuals are often much less rational and egoistic as originally assumed. Yet, it is still elusive what causes these systematic deviations from the rational choice ideal. Interestingly, not only human decision-makers, but also nonhuman animals often act seemingly inconsistent with their revealed preferences, for example, when foraging for food. Humans and animals often make similar, maybe even identical decision “errors”. These intriguing parallels in human and animal choice patterns support the premise that they may share evolutionary roots. In my talk, I will argue in favor of the idea that the reality of decision-making with all its facets, including action against one’s own preferences, has to be understood in light of the nature, constraint and evolution of the neural apparatus supporting its function. I propose that the neural architecture of choice has evolved to its current state because it provided decision-makers with an adaptive advantage. This means that, even though there might exist a many-to-one mapping of neural implementations to choice processes, careful comparisons across species can complement human microeconomics research by supplying possible answers to the question why we make decisions as we do.

Gernot Müller-Putz—Hot Topic Talk

The power of EEG: From single channel to high resolution derivations

The talk briefly describes the neurophysiological foundation of EEG, recording methods, artifacts, type of electrodes and amplifiers. The main part will contain the discussion of using EEG depending on the number of derivations used and type of application as there are (i) single channel EEG and neurofeedback, (ii) medium number of channels to differentiate between brain states and (iii) high resolution EEG for functional brain imaging. A brief outlook to future applications of EEG will conclude this talk.