



Press Release

## **A mere urge or a deliberate intention?**

Scientists address the relevance of philosophical intention theories to brain-machine interfaces

When a seat mate on a train is talking loudly on the cell phone, one may experience an urge to grab the phone away, but may reach for one's set of earplugs instead. The distinction between a spontaneous urge, a deliberate intention, an abstract wish, and the usual compromise between them is generally not a major problem for humans in every day life. But what if brain activity has to be used to give paralysed patients control over prosthetic devices? Here, a clear differentiation between these different mental states is necessary. Thus, these concepts gain very concrete significance in the field of neurotechnology.

**Franziska Thinnes-Elker, Olga Iljina** and Dr. **Tonio Ball**, together with colleagues from the Epilepsy Center at the University Medical Center Freiburg, the Bernstein Center Freiburg, and the University of Technology Eindhoven inquired how different forms of intentions can be differentiated, as accurately as possible, for such technical applications. In their recent article in the journal "Frontiers in Psychology," the researchers suggest that the philosophy of mind can provide significant contributions to help solve this practical problem. For instance, this branch of philosophy tackles the distinction between actual intentions and mere urges, addresses temporal evolution of intentions over time, and discusses when humans consciously perceive their intentions. The Freiburg scientists therefore suggest integrating philosophical concepts of intentions into the ongoing

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development of brain-machine interfaces, which is one of the major aims of the newly founded Cluster of Excellence BrainLinks-BrainTools in Freiburg. However, where exactly in the brain intentions can be inferred from the activity of the nerve cells is currently not at all clear. Studies report dozens of sites, scattered over the entire brain. According to the researchers from Freiburg, a possible reason for this could be that previous studies may have investigated different types of intentions, likely represented in different brain areas. For this reason they suggest that a philosophically-informed approach to study intentions may be helpful.

As the researchers point out, they hope not only to provide more usable concepts for intention-based brain-machine interfaces, but also to foster an on-going exchange between neurotechnology and philosophy.

**Image:**

Concepts from the philosophy of mind might contribute greatly to the development of brain-machine interfaces by clearly distinguishing between different types of intentions. This a prerequisite for searching corresponding neural signals in the human brain.

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