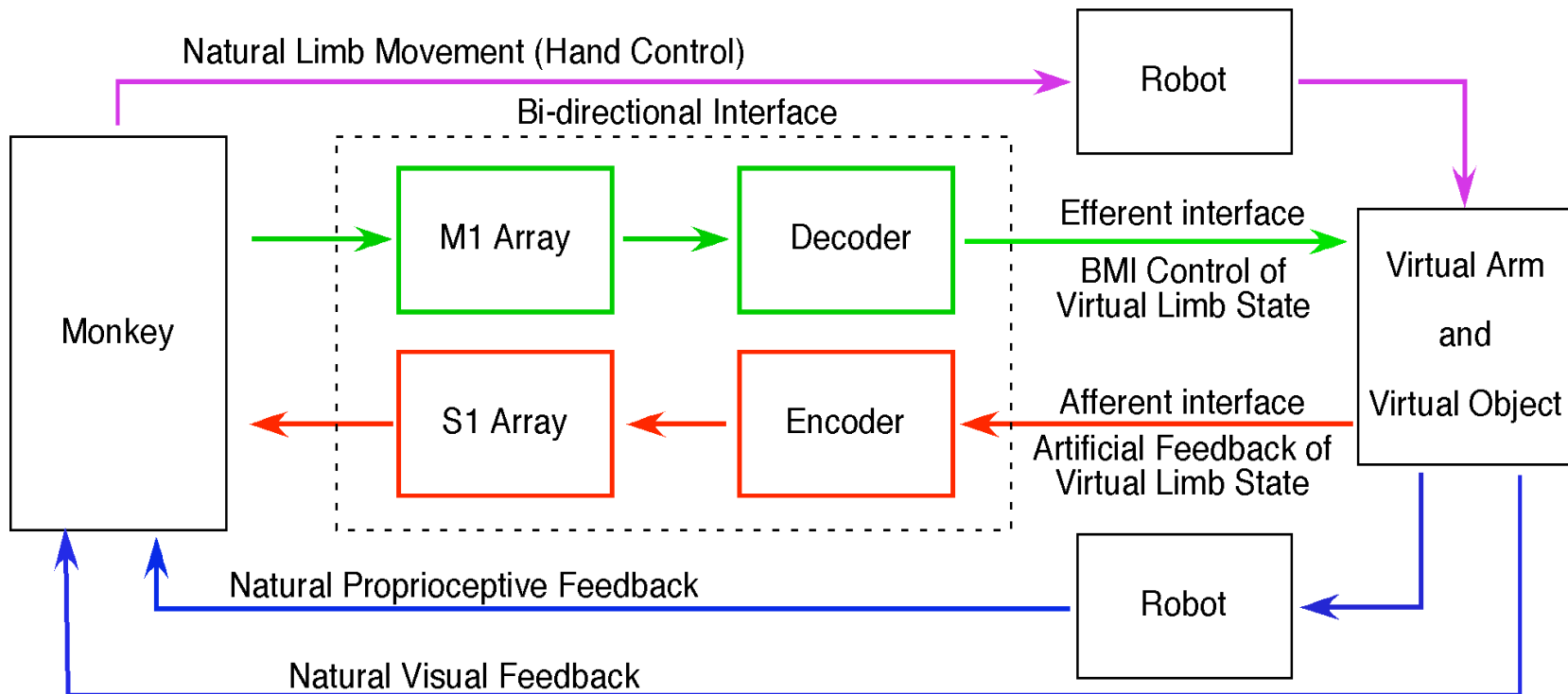


Opportunities in NeuroPhysics: Research

Interfaces between specific cortical areas and an external device provide a tool for investigating functional and computational capabilities. The nature of internal representations can be investigated through efferent and afferent interfaces that focus on information decoding and encoding, respectively. Beyond its obvious importance for robotics and clinical applications, this scenario provides both an opportunity and a challenge that calls for the coordinated effort of neuroscientists, mathematicians, physicists, computer scientists, and engineers.



Opportunities in NeuroPhysics: Training

The collaboration between experimental scientists trained in neuroscience and theoretical scientists trained in physics, mathematics, or computer science is a rather recent development that has resulted in a new area of neuroscience research, usually referred to as *Computational and/or Theoretical Neuroscience*.

Theorists that contribute to this area have a quantitative training acquired during their undergraduate or graduate years, and learn neuroscience as graduate students or when they decide on a career switch during their postdoctoral years. We need to develop viable structures for training these young colleagues in neuroscience, including an early exposure to experimental research.

Experimentalists that contribute to this area are typically more established scientists, sometimes with an early undergraduate training in physics or mathematics, who are often drawn into the appreciation and use of quantitative models through an active collaboration with a theoretical colleague. We need to develop and implement mechanisms for exposing experimentally trained neuroscientists to the conceptual, analytical, and computational frameworks of mathematical modeling earlier in their careers.