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IISc launches 'Moonshot' project on brain co-processors supported by Pratiksha Trust

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To work on a critical medical challenge i.e. stroke rehabilitation



The Indian Institute of Science (IISc), Bengaluru has launched an ambitious "moonshot" project to develop brain co-processors that combine neuromorphic hardware and artificial intelligence (AI) algorithms to enhance or restore brain function.

The project is generously funded by the Pratiksha Trust, founded by Senapathy 'Kris' Gopalakrishnan and Sudha Gopalakrishnan.

The moonshot project is a multidisciplinary endeavour that evolved from a pilot project seeded by IISc's Brain, Computation and Data Science initiative – a cross-departmental programme involving more than 20 faculty members – which is also supported by the Pratiksha Trust.

The primary goal of the moonshot project is to develop both implantable and non-invasive brain co-processors that can decode brain activity from neural recordings, process it with an AI algorithm, and re-encode signals back into the brain via neural stimulation or neurofeedback.

Such co-processors will be deployed towards cognitive rehabilitation of stroke survivors, to restore critical functions such as goal-directed reach and grasp abilities.

In the first phase, the project team seeks to develop, validate, and refine a non-invasive neural co-processor that can provide sensorimotor feedback for goal-directed reaching in stroke survivors, while also doing the groundwork, in parallel, for an invasive co-processor implant. In the second phase, the goal is to develop an embedded, minimally invasive co-processor to restore sensorimotor coordination and goal-directed reaching in individuals with chronic, multi-domain deficits following middle cerebral artery (MCA) stroke.

The IISc team will work with medical professionals and researchers across the country to clinically validate and deploy these co-processors in line with national and international standards and guidelines. They will incorporate feedback from neurologists, therapists, patients, and caregivers throughout the development process, and will also work closely with collaborators at research institutions in India and worldwide.