Neurorestoration and Data Science

Re-wiring Hope, Together

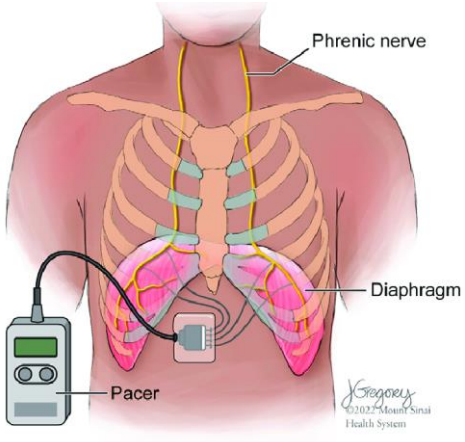
-Deepti Bhargava

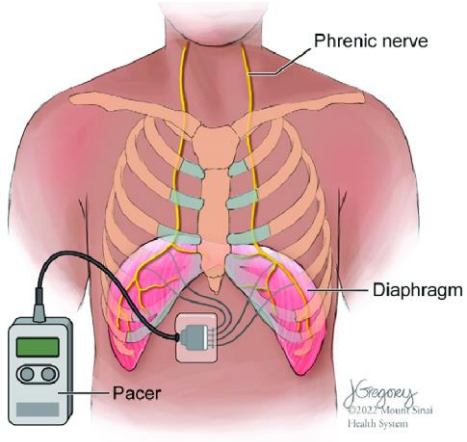
Neurosurgeon

What is Neurorestoration?

- Getting back lost neurological function
  - Overactivity- Pain and Spasticity
  - Lack of function- Motor, Breathing, Continence, Cognition
- Different from Rehab (Compensation) and Prosthetics (Substitution)

Current Options





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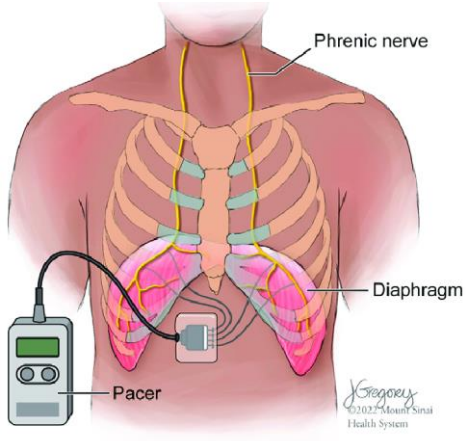

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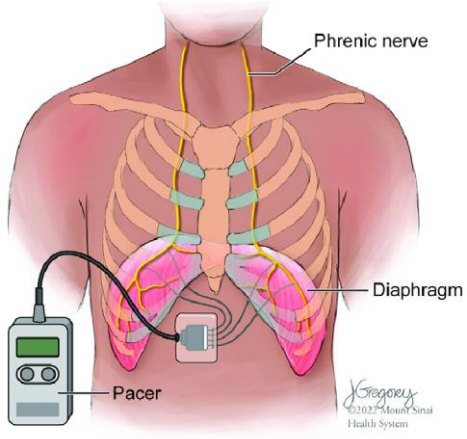

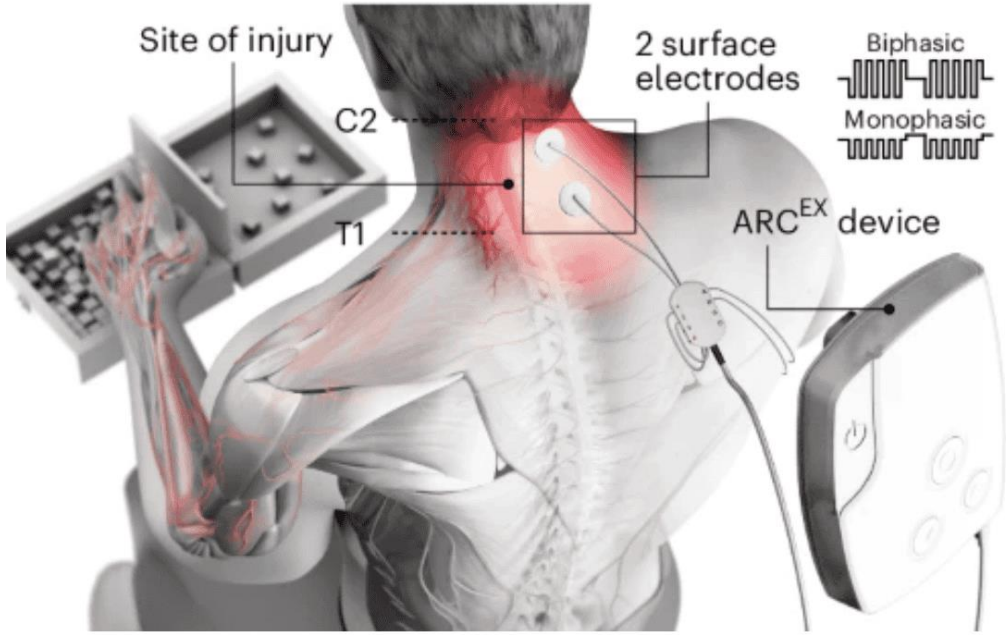

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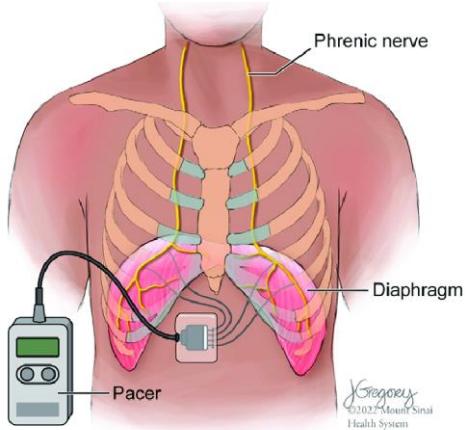

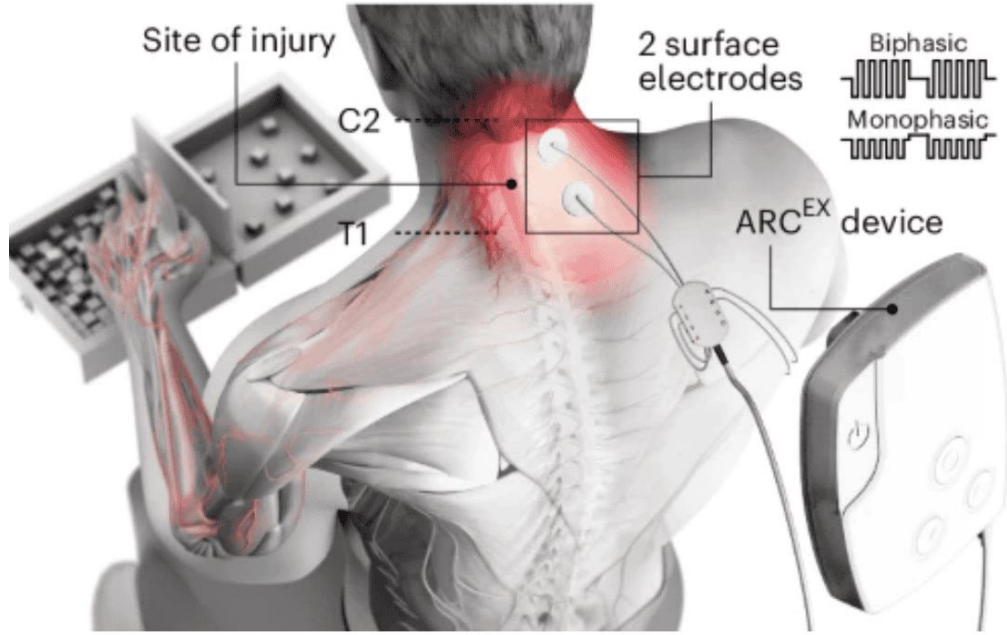

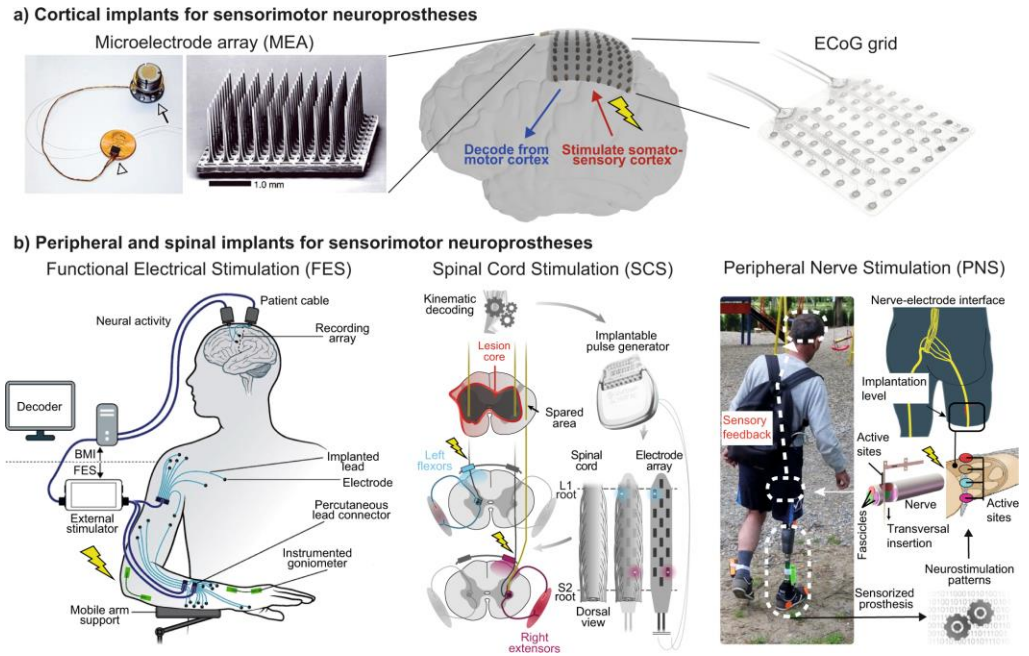

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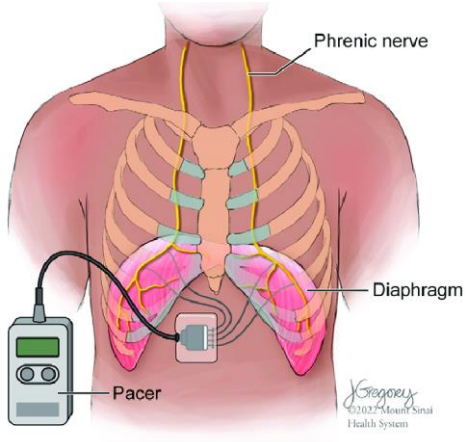
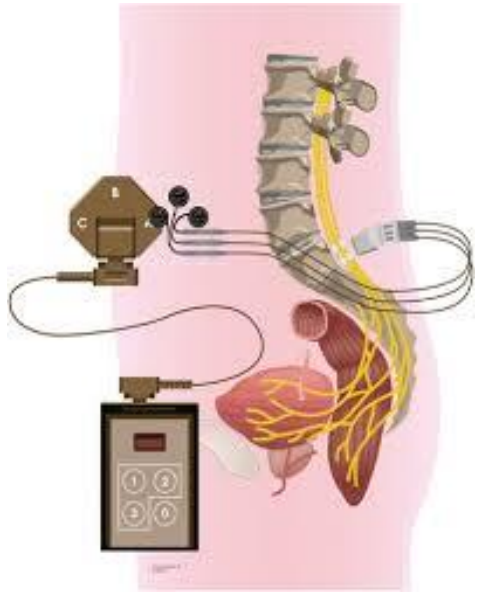
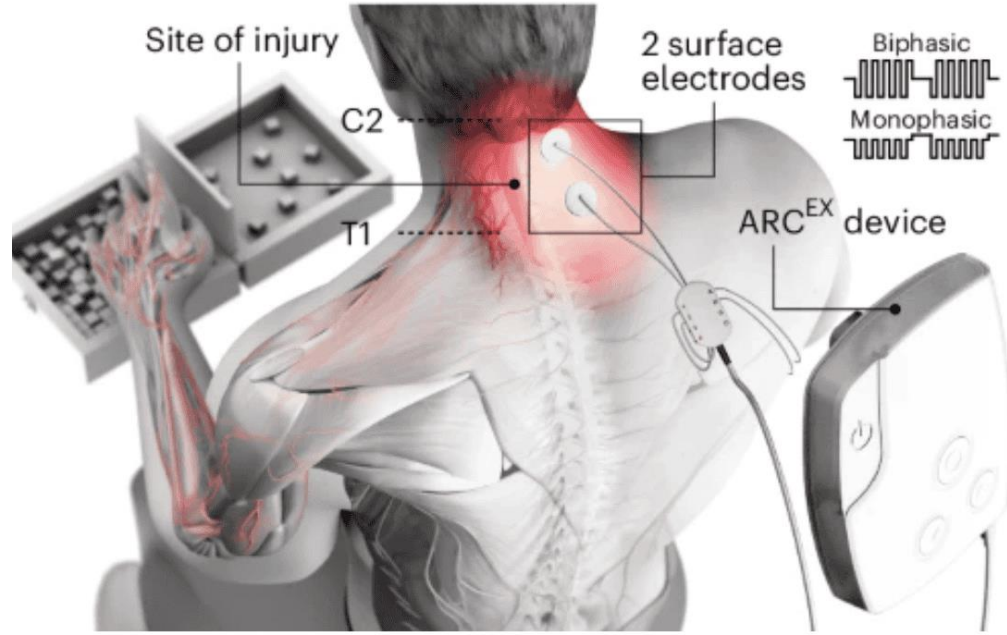
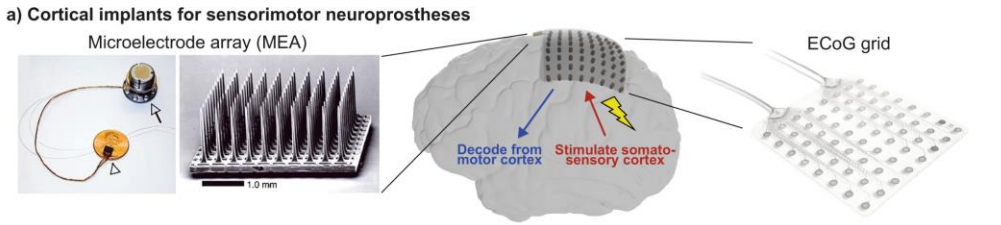
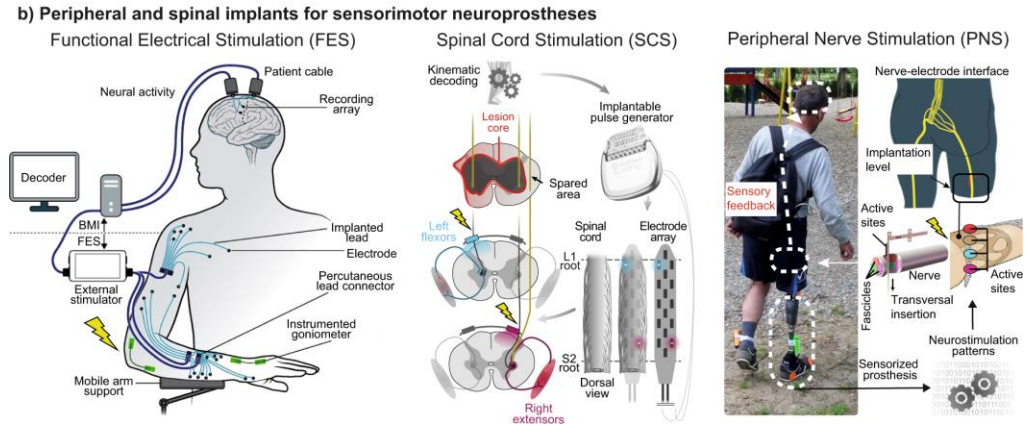










Limitations of Current Systems

- Invasive/heavy
- Custom- built and hard to scale
- Data-poor (no real time feedback or adaptation)
- Expensive and resource intensive
- Poorly personalised
- Time consuming

What difference could Data Science make?

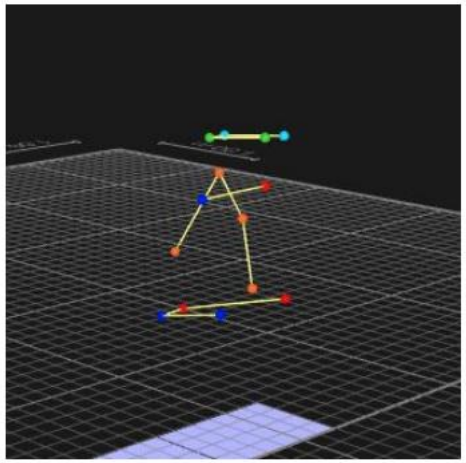
Bridge the gap- Success in Neurorestoration is dependent on improving understanding of the complex brain/spine dynamics and providing adaptive modulation:

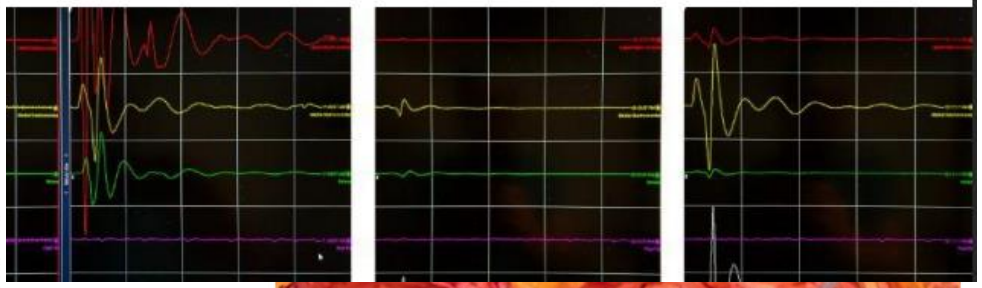
- Sensor fusion
- Real-time analytics, smart algorithms
- Predictive Modelling
- Seamless integration of treatment modalities
- Scalability

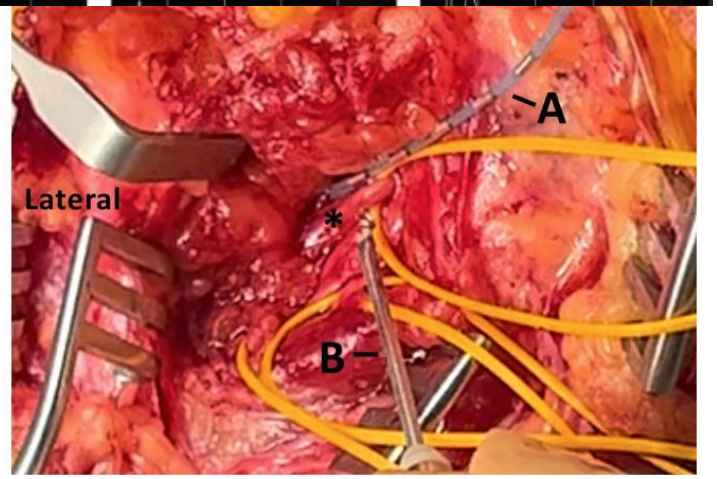
Things are already changing

Local Projects

- Stand and Transfer system modelling
- Upper limb movement algorithm and modelling
- Trunk stability enhancement
- Minimally invasive continence system
- Reversible spasticity /Motor stim/ sensory feedback system







Would you like to be a part of this exiting future?

Many thanks for your attention!