AI healthcare research: Pioneering iSMART Lab

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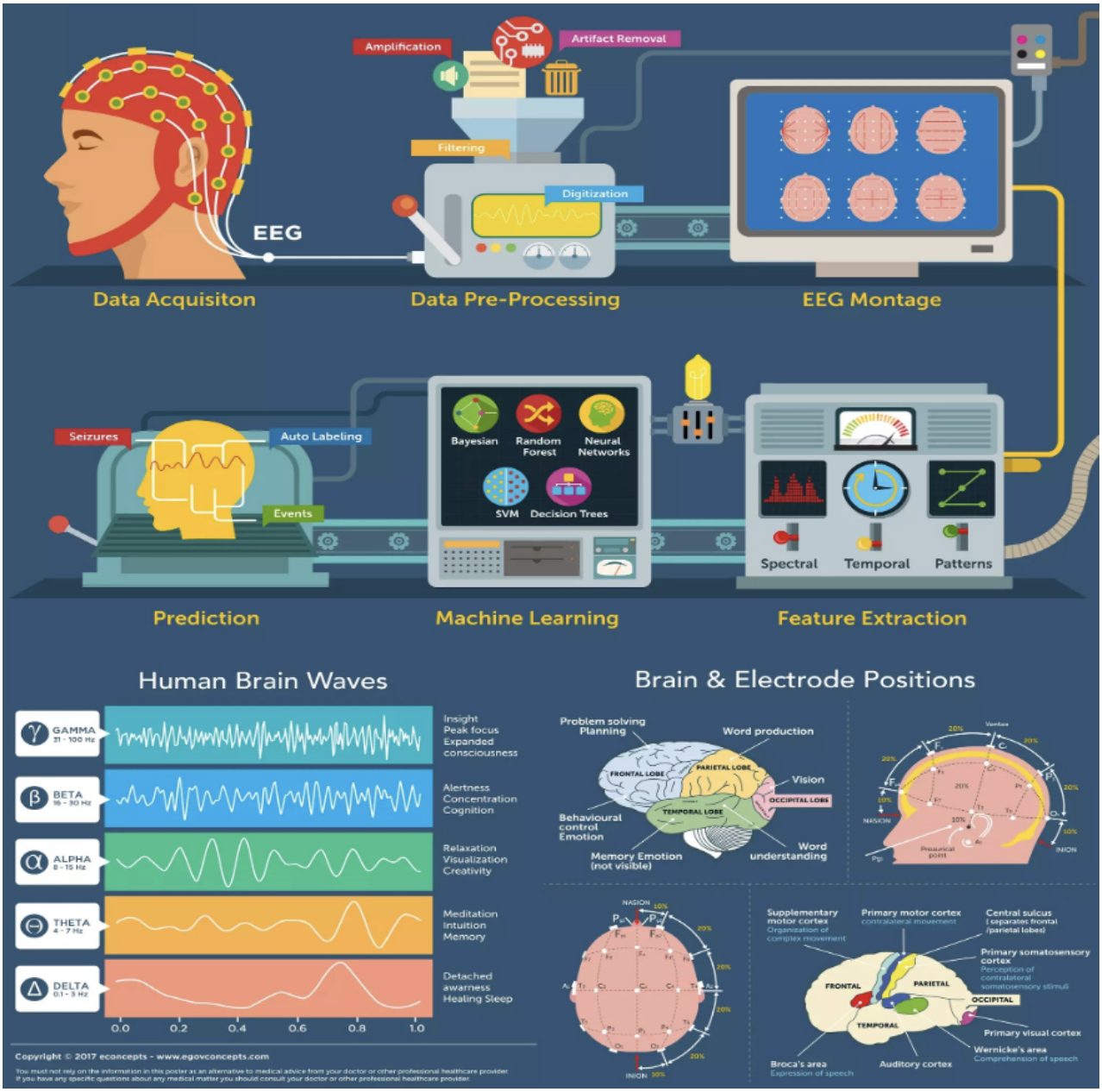

Figure 1: An example of EEG dataset and a typical intelligent system.

Dr Narges Armanfard, Professor, talks us through the AI healthcare research at McGill University which is spearheading a groundbreaking initiative – the iSMART Lab

Access to high-quality healthcare is not just a fundamental human right; it is the bedrock of our societal wellbeing, with the crucial roles played by doctors, nurses, and hospitals. Yet, healthcare systems globally face mounting challenges, particularly from aging populations. Dr Narges Armanfard, affiliated with McGill University and Mila Quebec AI Institute in Montreal, Canada, has spearheaded a groundbreaking initiative – the iSMART

Lab. This laboratory represents a revolutionary leap into the future of healthcare, with its pioneering research in AI for health applications garnering significant attention. Renowned for its innovative integration of AI across diverse domains, iSMART Lab stands at the forefront of harnessing Artificial Intelligence to elevate and streamline health services.

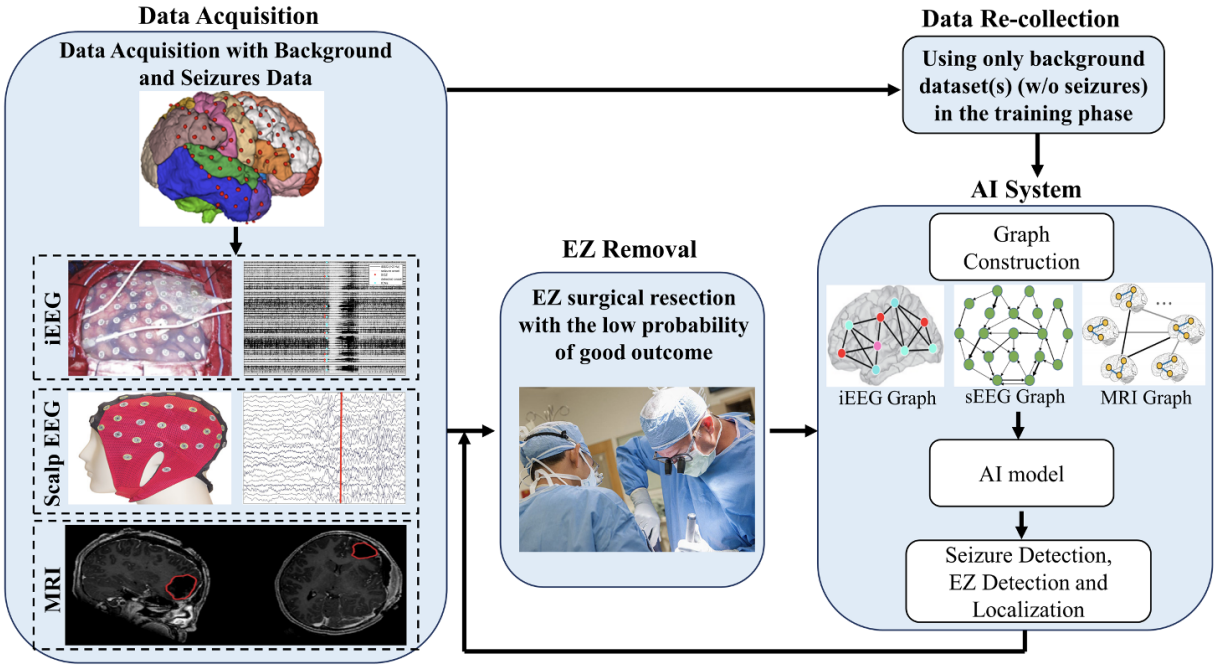

Figure 2: A framework for the epilepsy project

AI healthcare research: Transforming remote patient monitoring through telehealth

At the heart of iSMART Lab's breakthroughs lies the development of advanced AI algorithms for telehealth monitoring. These algorithms process an array of health data, from vital signals to video recordings obtained through remote monitoring devices. The goal? Providing real-time insights into a patient's health status, thus revolutionizing remote medical consultations.

Going beyond conventional approaches, iSMART Lab pioneers the integration of computer vision into telehealth applications. Imagine monitoring patients remotely, with AI interpreting visual cues like changes in blood pressure and physical movements. For example, one of the lab's ambitious projects aims to estimate physiological signals, particularly blood pressure, from video signals—ushering in a new era of accessible and convenient healthcare.

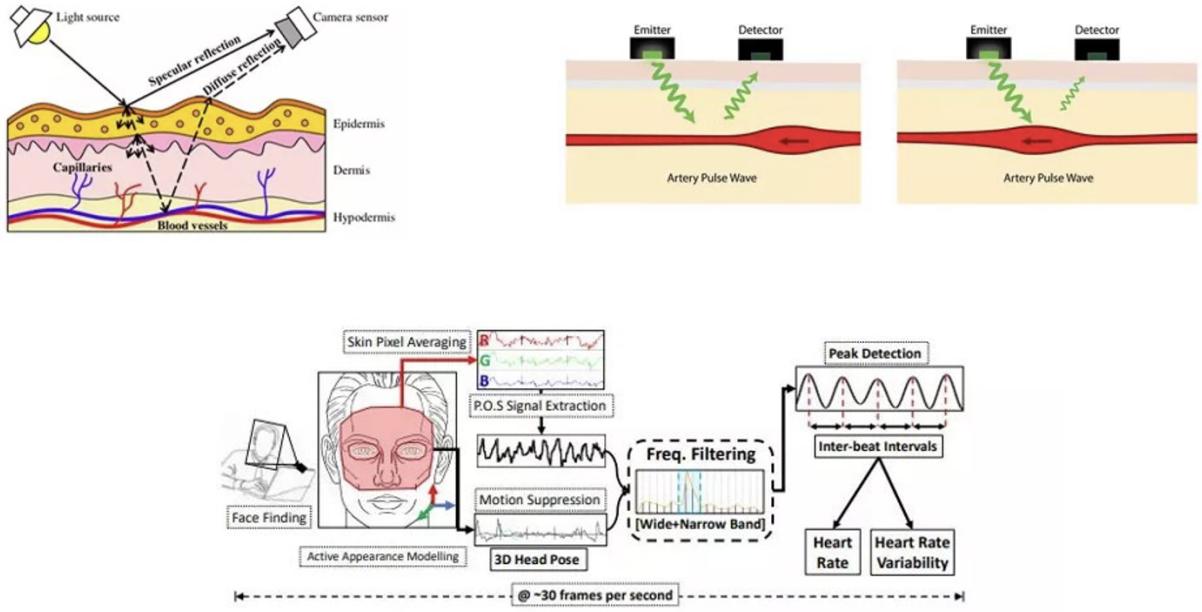

Figure 3: A framework for remote blood pressure measurement

AI healthcare research: Redefining diagnostics with unprecedented precision in brain disorders

Delving into the realm of brain disorders, iSMART Lab's AI-assistive technologies promise groundbreaking advancements. From Alzheimer's to epilepsy, the lab's research aims to redefine diagnostics and improve patient care.

For example, for the first time, iSMART Lab is developing an AI-based system to rigorously and objectively identify the Epileptogenic Zone (EZ) using intracerebral electroencephalography (iEEG). Unlike the current gold standard, this innovative approach utilizes advanced computational techniques, including self-supervised and multi-modal learning. The result? An AI model that guides neurologists in determining which brain regions must be resected during epilepsy surgery, potentially reducing the need for prolonged hospitalization.

The implications extend beyond epilepsy, as iSMART Lab anticipates the broader application of their AI expert systems in identifying abnormal brain activities associated with various disorders. This groundbreaking research contributes not only to epilepsy care but also advances knowledge in active AI healthcare research areas, opening new doors for the future of brain disorder diagnostics.

iSMART Lab – shaping tomorrow's AI healthcare today

iSMART Lab's commitment to advancing healthcare through cutting- edge technology is evident in its groundbreaking projects. As the lab continues refining and expanding its research horizons, the potential impact on global healthcare systems becomes increasingly profound. iSMART Lab's innovations promise a brighter and more accessible medical landscape.

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