Inventor Business Card:



Prof. Mustafa Serkan Kiranyaz,
Professor of Electrical Engineering, College of Engineering - Qatar University

Prof. Serkan, we would like to begin with a brief introduction of yourself and your academic and research career, as well as your key scientific milestones.

I am Dr. Serkan Kiranyaz, Professor of Electrical Engineering at Qatar University, specializing in artificial intelligence, signal processing, and biomedical engineering. My research career has focused on developing adaptive and learning-based systems, particularly in real-time signal analysis and medical applications. Key milestones include pioneering self-organizing and evolutionary AI systems, advancing 1D and high-end deep learning paradigms, and translating these innovations into healthcare solutions—especially in cardiac diagnostics. My prior work has led to numerous high-impact publications, patents, and industrial collaborations.

What medical problem or clinical challenge does the CardioVision system aim to address?

CardioVision addresses the fundamental gap between accessibility and diagnostic quality in cardiac imaging. While echocardiography is widely available and cost-effective, it suffers from limited contrast, operator dependency, and artifacts. Cardiac MRI provides superior anatomical detail but is expensive, time-consuming, and not widely accessible. CardioVision aims to bridge this gap by delivering MRI-like diagnostic insight directly from ultrasound, improving diagnostic confidence without requiring additional hardware.

How does the CardioVision system, based on artificial intelligence, process cardiac imaging data and transform it into clinically meaningful diagnostic outputs?

CardioVision uses advanced deep learning models, including transformer-based architectures, to learn the relationship between ultrasound and MRI imaging domains. The system processes echocardiographic data through a pipeline involving preprocessing, feature extraction, and cross-modality transformation. The AI model enhances image quality by reducing artifacts, improving contrast, and reconstructing structural details. The output is a synthetic MRI-style image that provides clinically meaningful visualization, supporting improved interpretation and decision-making while maintaining the workflow of standard ultrasound.

What are your most significant research contributions and innovations in medical and industrial signal processing?

My research contributions span both medical and industrial signal processing. In healthcare, I have introduced novel methods for ECG analysis, arrhythmia detection, and real-time patient monitoring, often using adaptive and self-learning AI systems. I have also contributed to deep learning for time-series and low-latency data processing, with applications in wearable and remote health technologies. In industry, my work includes intelligent monitoring systems, predictive analytics, and embedded AI solutions. A key innovation theme is computational efficiency and real-time adaptability, enabling AI deployment in resource-constrained environments.

How do you describe the role of Qatar University in supporting research and innovation throughout your academic career?

Qatar University has played a pivotal role in supporting my research and innovation activities by providing a collaborative, interdisciplinary environment and strong institutional backing. The university facilitates access to funding, research infrastructure, and international collaborations. It actively promotes innovation, patenting, and technology transfer, which has been instrumental in advancing projects like CardioVision from an idea to proof-of-concept. This supportive ecosystem enables impactful research aligned with national and global healthcare priorities.