

**IEEE Engineering in Medicine and Biology Distinguished Lecture**

**Cardiovascular Health Informatics: Predicting the Risk of Stroke Based on  
Ultrasound Image Analysis of the Atherosclerotic Carotid Plaque**

**Constantinos S. Pattichis**

**Department of Computer Science, University of Cyprus, Cyprus**

**Email: [pattichi \[at\] ucy.ac.cy](mailto:pattichi@ucy.ac.cy) Website: [www.ehealthlab.cs.ucy.ac.cy](http://www.ehealthlab.cs.ucy.ac.cy)**

*Abstract:* Cardiovascular (CV) disease is one of the most common causes of death worldwide and represents a major financial burden for national economies. Effective prediction and prevention of CV disease particularly that which resulted from high-risk asymptomatic atherosclerosis, has now become a top priority. The goal of this lecture will be to give a review of non-invasive ultrasound image processing methods that are used to facilitate the intelligent analysis of carotid plaque morphology for predicting stroke risk. The lecture will begin with a review of clinical methods for visual classification that have led to standardized methods for image acquisition. Methods for ultrasound imaging atherosclerotic plaque denoising, and image segmentation will then be described, followed by an overview of the several multi-scale texture-feature extraction algorithms and classification methods investigated. Risk modeling based on clinical and ultrasonic plaque texture features that enable the assessment of the risk of stroke will be described.

*Short-Bio:* He is currently Professor with the Department of Computer Science of the University of Cyprus. His research interests include ehealth and mhealth, medical imaging, biosignal analysis, life sciences informatics, and intelligent systems. He has published 80 refereed journal and 190 conference papers, and 27 chapters in books in these areas. He is Co-Editor of the books *M-Health: Emerging Mobile Health Systems*, and of the *Ultrasound and Carotid Bifurcation Atherosclerosis*, published by Springer in 2006, and 2012 respectively. He was Guest Co-Editor of 11 journal Special Issues including the more recent ones on *Atherosclerotic Cardiovascular Health Informatics*, and *Citizen Centered e-Health Systems in a Global Health-care Environment*, of the IEEE Trans. on Information Technology in Biomedicine. He was General Co-Chairman of the *IEEE 12<sup>th</sup> International Conference on Bioinformatics and BioEngineering (BIBE2012)*, and the *IEEE Information Technology in Biomedicine (ITAB09)*. Moreover, he serves as Distinguished Lecturer of the IEEE EMBS, an Associate Editor of the IEEE Journal of Biomedical and Health Informatics, and on the Editorial Board of the Journal of Biomedical Signal Processing and Control. He is a Fellow of IET, and Senior Member of IEEE.