

Abstract Submitted
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Noninvasive Central Blood Pressure Measurement Methodology Inspired From Tonometry and Oscillometric Principles. ALESSIO TAMBORINI, MORTEZA GHARIB, Caltech — Why does blood pressure measurement location influence patient prognosis? Blood pressure has a spatial and temporal dependence in the cardiovascular system. When forward propagating pressure waves reach reflections sites, they reflect backwards with patient specific intensity and shape. Superposition of forward and backward pressure waves is location and time dependent and directly influences blood pressure. In cardiology, blood pressure measurements are used as prognostic markers for heart health. Thus, the ideal outcome is determining pressure in the ascending aorta: central blood pressure. Yet, the clinical gold standard still assesses blood pressure in peripheral arteries. Clinicians have been using this measurement as a surrogate for central blood pressure, often obtaining limited cardiovascular information that can lead to incorrect clinical decisions. Central blood pressure measurement is seldom obtained due to measurement invasiveness and complexity. To address these limitations, we are proposing a noninvasive spatially dependent blood pressure measurement at the carotid artery. Our application combines tonometry and oscillometric sphygmomanometer principles with pulse wave analysis for patient specific carotid pressure measurements.

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