

COHERENT SPATIAL IMAGING OF HEMODYNAMICS

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Key Words: laser speckle imaging, wearable sensor, speckle contrast, speckleplethysmography, coherent spatial frequency domain imaging

We explored the integration of laser speckle imaging (LSI) and spatially resolved diffuse reflectance spectroscopy (srDRS) in a wearable coherent spatial imaging (CSI) sensor for assessing tissue perfusion and oxygenation. LSI analyzes laser light scattered by moving red blood cells to measure hemodynamics with high temporal resolution. srDRS measures tissue reflectance properties to provide insights into tissue composition and oxygenation. By combining LSI and srDRS, CSI enables continuous quantitative monitoring of perfusion dynamics and tissue oxygenation. In our presentation, we will describe the theoretical framework and previous imaging studies that culminate in the development and validation of the wearable sensor.

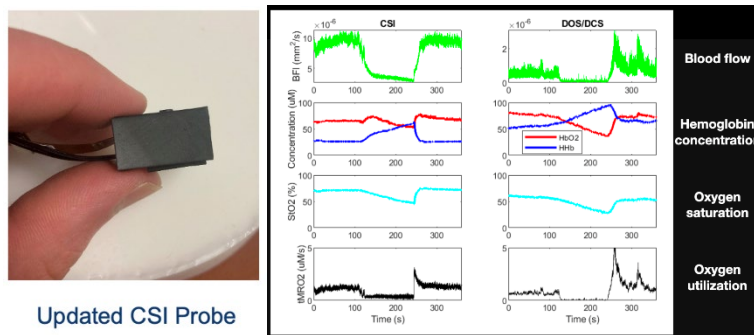


Figure 1 (Left) Prototype coherent spatial imaging sensor (Right) Representative comparison of simultaneous measurements collected with a coherent spatial imaging and a laboratory-grade diffuse optical spectroscopy/diffuse correlation spectroscopy (DOS/DCS) device during a brachial artery occlusion experiment.