Research Title:

Smart Wearable Sensors for Monitoring Stress and Load in Driving Tasks

Primary Investigator:

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The current research is a unique collaboration between chemical engineering and applied psychology, aimed to develop non-intrusive dynamic chemically based sensors for volatile organic compounds (VOCs) detection, as an objective and real-time tool assessing driver's stress level. The ability of chemical sensors to sense and measure markers of stress levels in exhaled breath and/or skin headspace will be further developed to be used in a dynamic ongoing way. To that end, we will first conduct basic experiments with ascending levels of cognitive task difficulty, to develop and validate the tool. After the tool's validation stage will be completed, we will test its ability to detect ongoing real-time stress of drivers in a driving simulator experiment. To manipulate the stress, we will employ up-to-date experimental driving simulator paradigm, which measure drivers' performance in different conditions of perceptual load and in the presence of preplanned critical events. These non-intrusive sensors may enable measuring ongoing stress during driving, without interrupting the driver's performance, and potentially have many applications for in-car systems. More broadly, these sensors may allow measurement of stress during continuous performance of any driving task.