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Analytical Chemistry Seminar

Tuesday, February 15, 2022
3:30 PM, WTHR 320

"Solid Carbon Dot Nanoparticles for Latent Fingerprint Detection and Identification"

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Abstract: Latent fingerprints (LFP) are hard-to-see impressions of ridges and furrows in the palmer surface of the finger from skin secretions and can be used as vital evidence for personal identification in criminal investigations. LFPs have traditionally been detected with powder dusting and identified using biometrics, but solid carbon dot nanoparticles have been found to be a promising alternative to commercially available powders. Through various studies, carbon dots with SiO_2 nanoparticles have been proven to be more selective, effective, and sensitive for LFP detection. In addition to LFP detection, the use of solid carbon dot nanoparticles was combined with artificial intelligence analysis using MATLAB to determine the similarity between two fingerprints. The LFPs dusted with red-fluorescent carbon dots produced higher matching scores than LFPs developed with the traditional method used by the police. This seminar will present these improvements and discuss the strengths and challenges of the use of solid carbon dots for LFP detection.

Seminar Time shared with Caleb Buchanan