ENGAGING UNDERGRADUATE STUDENTS IN SPECTROSCOPY RESEARCH VIA DEVELOPMENT AND INCORPORATION OF ADVANCED DATA ANALYSIS TECHNIQUES

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The rapidity with which large amounts of spectroscopic data can now be collected is presently driving interest in developing techniques to improve the speed with which spectra can be analyzed. While desirable in a research setting to avoid bottlenecks in the lab, these techniques will also be essential to the commercialization of high resolution spectroscopic methods for analysis of complex mixtures. At the same time, many undergraduate students are intrigued by the concept of data analytics and attracted by the growing job market related to this field. We will present our incorporation of analysis techniques appropriate for large data sets into undergraduate spectroscopy research experiences. Through analysis of high sensitivity microwave spectra of complex mixtures of weakly bound complexes, undergraduate students from a wide range of majors gain skill sets that put them ahead of their peers in areas such as problem solving, basic coding, and computer skills (Excel, DOS, Linux, Python, Mathcad). The majority of spectroscopy undergraduate research students at Eastern Illinois University do not go on to chemistry careers, and these additional skills that they learn provide excellent preparation for a wide range of career choices.