

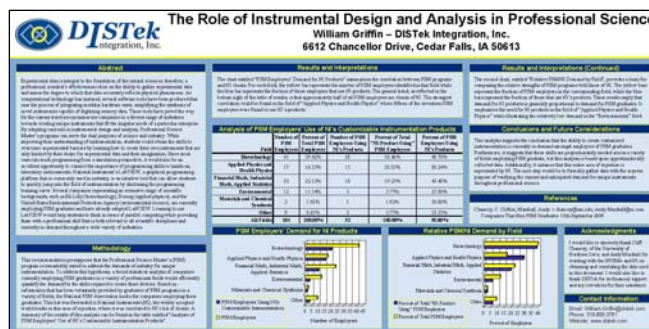
The Role of Instrumental Design and Analysis in Professional Science

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Experimental data are integral to the foundation of the natural sciences; therefore a professional scientist's effectiveness relies on the ability to gather experimental data and assess the degree to which those data accurately reflect physical phenomena.

As computational technology has matured, several software tools have been produced that ease the process of integrating modular hardware units, simplifying the synthesis of novel instruments capable of digitizing sensory data. These tools have paved the way for the current trend across numerous companies in a diverse range of industries towards creating unique instruments that fit the singular needs of a particular enterprise. By adopting curricula in instrumental design and analysis, Professional Science Master's programs can serve the dual purposes of science and industry.

While improving their understanding of instrumentation, students could obtain the skills to overcome experimental barriers by learning how to create their own instruments that are only limited by their desire for experimental data and their imagination. Since most curricula teach programming from a simulation perspective, it would also be an excellent opportunity to connect the importance of programming skills to hands-



on, laboratory environments. National Instrument's LabVIEW, a graphical programming platform that is commonly used in industry, is an intuitive tool that can allow students to quickly jump into the field of instrumentation by shortening the programming learning curve.

Several companies representing an extensive range of scientific backgrounds, such as Eli Lilly (biotechnology), Boeing (applied physics), and the United States Environmental Protection Agency (environmental science), are currently employing PSM graduates and have already adopted LabVIEW. Learning to use LabVIEW would help students to think in terms of parallel computing while providing them with a professional skill that is both relevant to all scientific disciplines and currently in demand throughout a wide variety of industries.