



PASER: Parallel Database Search Engine in Real-Time and beyond

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We developed PASER (Parallel Database Search Engine in Real-Time), which performs database searching in parallel with data acquisition on a high-speed timsTOF Pro mass spectrometer. To perform a database search in real-time, PASER adopts a fast IP2-GPU ProLuCID search engine. Using PASER, we demonstrate the simultaneous completion of database searching and MS spectra acquisition. The PASER search engine can keep up with the 120Hz MS/MS-acquisition speed of the timsTOF Pro instrument, saving significant time by elimination of separate data extraction and protein database search steps, thus enabling true high-throughput proteomics data analysis in an automated way. PASER is scalable and can perform searches on data from multiple timsTOF instruments without compromising the search speed on any of the data analyses.