Application of Artificial Intelligence in Tuning Femtosecond Laser Systems VLAD GACIU, University of Massachusetts Lowell — This work describes a design used to automate a tunable laser system to correctly and autonomously reach user requested peak wavelengths and spectral widths. This laser system is comprised of a tunable mode-locked femtosecond laser. The system is tunable by mechanical motors programmable with software. Varying slit width and slit position shift the peak in opposite directions, which allows a secondary tuning of the spectral width, which is only dependent on the slit width. The automation displays a level of artificial intelligence where the program acquires data autonomously and applies machine learning techniques to predict and understand a suitable slit position and slit width for any desired output. This design does not require an experienced user and can significantly save time. Future developments with the current design can be made to automate larger and more complicated tunable laser systems. This is a new area of research which can help pave the way for more advanced use in the ultrafast laser industry.

Vlad Gaciu
University of Massachusetts Lowell

Date submitted: 26 Sep 2019   Electronic form version 1.4