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A flexible and user friendly CPU-based AO software

An Adaptive Optics control system can be implemented mainly on FPGA or CPU platforms. While FPGA is developed on dedicated hardware and has higher closed-loop performance, general-purpose CPU hardware is more flexible and less expensive for the end user. We present a CPU-based solution consisting in a C++ software, relying on the cross-platform Qt libraries. This framework covers wavefront measurement and controller closed-loop tuning, with logging and scripting features to automate long-running experiments with a simple and user friendly graphical interface. We identify, tune, validate and evaluate our software architecture, installed on a consumer-grade notebook, by interfacing it with a wavefront sensor and a deformable mirror on a test-bench Adaptive Optics system. Experiments with control frequency at 1kHz and 2 frames of latency, show that our solutions corrects aberrations with bandwidth cut-off up to 30Hz.

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