

Title: Kit-bashing camera code: Lessons in developing auto-assist tools to compliment the GIGAMacro Photography System

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Abstract: Recent advancements in photography hardware and software, such as the GIGAMacro Photography System, allow collections workers to capture thousands of high-resolution, wide focal-depth photographs a day with minimal manual effort. The front-end work of camera setup is the most time-consuming task, with the bulk time spent specifying where in the tray the camera should photograph. The GIGAMacro software package does not include a tool to reduce or help automate this setup, so we developed our own. The tool we designed is an intuitive user interface that is linked to scripted processes to semi-automate the setup process. On average, this tool has decreased our camera setup time by 98.5%. The development process involved a feedback loop of gathering comments and suggestions, implementing features, and testing with different end-users. The resulting auto-assist tool is designed to be accessible for workers with varying levels of experience and is wholly contained in one Excel document for portable use.

We chose to develop our camera setup tool in Excel due to broad user familiarity and presence of necessary supporting components. Both advantages greatly shortened development time. Additionally, Excel allowed us to change measurement or calculation numbers for the camera on the fly without having to recompile and/or install a new executable. The files that contain the camera setup runs (now numbering in the hundreds after two years) can be saved and reloaded easily on any of our network computers.

This Excel-based, custom tool compliments the extensive automated process that GIGAMacro provides. The tool fits into the front-end workflow of the entire digitization process, reduces manual setup time by almost two orders of magnitude, and can be employed by other research collections interested in digitizing thousands of microfossils. The software tool is freely available at <https://github.com/alex-zimmerman/GigaMacroAssit> along with user notes on how to employ and/or adapt the tool in other collections.

Keywords: auto-assist tool, GIGAMacro, microfossil photography