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Towards a Low Cost Synthetic Vision Capable Glass Cockpit

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Towards a Low Cost Synthetic Vision Capable Glass Cockpit

Donald Morris

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In the last few years, several world-changing things have occurred. Certainly the ability to build semiconductor based microchips with billions of transistors in less than the space of a postage qualifies. So, too, has the development of Micro Electromechanical Systems (MEMS) sensors. 30 years ago, a sensitive altimeter cost thousands of dollars. Today, a MEMS chip that costs less than two dollars is several times as precise. Another change is the availability of collaboration through open source software and hardware projects. These have given us low cost processing power and the tools to harness it – converting our two dollar sensor into a very cheap and accurate altimeter package. We can make parts using another outcome of open source hardware and software – the modern, low cost 3D printer.

Currently, I am working on interfacing low cost single-board computers (Raspberry PI) with open source Arduino microcontrollers and MEMS sensors to create a low cost synthetic Vision capable cockpit display. Programming of the single-board computer is through the open source platform Lazarus, an Object Oriented Pascal interface that allows OPENGL ES rendering of terrain graphics. I have written the specifications for a new TMFD Lazarus component which would form the core of a new open source cockpit platform. Optimized code is essential to allow these low cost computers to generate useful imagery in real time. This presentation will contain details of my work to date, as well as an invitation to those interested in collaboration to join me.