Small Computings for Clinicals and SCCToolKit, Simple and Affordable Trial Package and Software Development Kit

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Abstract

This paper is about "Small Computations for Clinicals", a design policy of our operation-room (OR) friendly research system, software, SCCToolKit, a software toolkit for this purpose, and a few examples. Examples are image processor for endoscope, OR event detector, vision based registration of ultrasound and endoscopic images, etc. We name Small Computations for Clinicals if a system is 1) single purpose, 2) turn-key system without using mouse and keyboard, 3) small form factor PC based, and 4) less than $1,000 USD (except clinical equipment or components easily available in hospitals). SCCToolKit is an OpenCV extension that could minimize the number of buffer copies from receiving image frames from operating system to render it to display buffer. It is open source under BSD license. We measured the latency of image capture to display of the endoscope image processor was between 0.13 to 0.2 second for 1920x1080 size display with chroma-key image mixing. Considering of the acceptable latency 0.2 second, the performance was as good as commercially available, custom hardware processor that could cost over $10,000 USD, while our PC based system costed $773 USD.