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Dr. Joshua M. Greenberg
Sloan Foundation
630 Fifth Avenue, Suite 2550
New York, NY, 10111.

Dear Dr. Greenberg,

I am pleased to write in support of the grant proposal by Dr. Greg Wilson to continue and expand the impact of the Software Carpentry effort in new directions. The problem that Software Carpentry is trying to tackle is arguably one of the most important in the evolution of contemporary scientific praxis, and yet it is one that is underfunded and poorly understood by traditional funding agencies and other mechanisms of regular academic work. The relationship between science and computing has changed dramatically in the last decade: from a past where the term 'scientific computing' was synonymous with numerical codes written in Fortran or C/C++ by physicists or chemists, we have rapidly arrived at a state where today, we can confidently state that virtually *all of science* is inherently computational. Every field of scientific work now requires large amounts of computing for data acquisition, modeling and analysis. Even laboratory-based sciences now rely on digital instruments, and disciplines such as biology have turned in a few years from hardly needing a computer for anything to becoming some of the fastest consumers of data storage and cpu power.

And yet, we continue to train our graduate students and postdocs without any real grounding in the use of the computer as a scientific research tool. Most academic programs assume that somehow their students will "pick up computing along the way" and that it's not worth devoting any real time or effort to this problem (that was exactly my experience during a physics PhD at a large US university). The results, unsurprisingly, tend to be rather poor: students learn how to program but not how to build robust, reliable and efficient computational tools capable of producing scientific outcomes that will stand the test of time.

The Software Carpentry project, under Dr. Wilson's leadership, has addressed this problem systematically. He has built and tested a curriculum that tries to efficiently give scientists, in a short amount of time, a key set of skills so they can wield the computer as a research instrument with the same rigor and precision that they use with a laboratory device or a mathematical proof. I can attest to how difficult this task is, having over the last ten years taught a number of similar workshops at universities and research laboratories all over the

world, but without the systematic buildup of tested materials and careful feedback that Dr. Wilson has used. He has taken this problem seriously enough to treat it like both a research question and a social problem, building a reliable feedback loop for the impact of his work as well as a team capable of spreading the impact of the project beyond what his personal schedule can allow. Based on this solid foundation, he now seeks to significantly expand the reach and the depth of the project, in ways that modernize its curriculum and that take into account the most recent changes brought by the internet to our computational practices.

I have no doubt that the Software Carpentry project is an excellent investment of funding resources, especially given how short-sighted our federal funding agencies have proven themselves to be on this problem.

Yours sincerely,

Fernando Pérez