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Cal Poly, UC Berkeley Awarded \$1 Million Grant for Collaborative Computing Project

SAN LUIS OBISPO — Cal Poly and UC Berkeley recently received a \$1 million grant from the Alfred P. Sloan Foundation for the development of the IPython Notebook, a project designed to make scientific and technical computing collaborative and interactive.

The Sloan Foundation funds high-impact work that is unlikely to be funded by the government or private foundations.

Python is an open-source programming language used across a wide range of industries and fields. It is especially popular in scientific and technical computing. IPython is an interactive environment for Python programming that allows users to see the results of their code as they're writing it, for example by producing a visualization of their data.

Physics Professor Brian Granger, Cal Poly's lead on the project, estimates that hundreds of thousands of people in such diverse fields as biostatistics, astronomy and finance will benefit from IPython. Current applications include analyzing massive gene sequencing datasets, processing images from the Hubble Space Telescope, and developing models of financial markets.

The IPython Notebook allows scientists to integrate code, plots, text, data, even video in one document and then share that document interactively with others. "We're trying to make scientific and technical computing collaborative and social. Life is social and people work in a very social way on the Internet now," Granger said. "This is all free and open source."

The developers have also been working for free, which limits the amount of time they can spend on the project. "We will use the resources from this grant to focus the effort of our team so we can tackle a number of difficult challenges we have not been able to work on," said Fernando Perez, UC Berkeley researcher and head of the IPython project.

The IPython Notebook also enables computational research to be reproduced. By combining code and results in a single document that can be shared and re-run, it allows scientists to more easily validate each other's results. "There's a lot of talk these days about making scientific and technical work reproducible. IPython Notebook makes computational research reproducible," Granger said.

Among other things, the Sloan Foundation will fund the development of multi-user support for the notebook, which will make it ideal for STEM (science, technology, engineering and mathematics) education. "The education of physicists and engineers at universities is still in the Dark Ages. It doesn't leverage all the great work in computing that has been done in the last decade," Granger said.

"The Notebook can change that. Teachers can prepare a lecture using the notebook and then turn it into a web-based slide show presentation in which you can write code and see the results of that code in real time. Students can then use it for homework and reports."

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