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Letter of Support for Kevin Flores who is applying for Participation in the DIMACS program

Kevin Flores is a Mexican-American student who is on his way to stardom. He has passed all his qualifying exams and written comprehensive-all a year and half after completing his bachelor's degree.

I am Kevin's Ph.D. advisor, and co-Chair of his dissertation committee. I met me when he participated as undergraduate in the summer research program sponsored by my institute, MTBI in 2004. He carried out a research project involving the mathematical modeling of tumor growth and drug treatment strategies. He used a highly sophisticated mathematical model (infinite dimensional) involving a nonlinear system of delay differential equations. In addition, he is an extraordinary computational scientist.

As his advisor, I provide guidance in the mathematics that should be done and connect him with people that he should be discussing the modeling with. I assess the value of the Kevin's project to the disciplinary field. Kevin is in a highly competitive field as many individuals work on cancer and yet his project on multi-scale modeling is the most biologically realistic and computationally intensive form of tumor growth to date.

I will be assessing the differences between analytic models of tumor growth and purely computational models, a controversy that has not yet been resolved.

Kevin has already begun this research and he has the essential code written in python which he expanding so that he can include even more detailed models of tumor growth. This computational research was conducted during the summer of 2006 at Los Alamos National Laboratory under the direction of Yi Jiang.

Kevin is now a regular visitor to the Lab and will continue to work with Yi for at least the next year on expanding this model.

Even if the computational models do not correlate with analytical models based on biological data, thanks to the work of Kevin, we will at least have a clearer picture of the reasons why. He soon will be working with experts at places like the Mayo Clinic or similarly research institutes as well as we facilitate (funding) his participation in NSF Mathematics Institutes activities (IMA, MBI, MSRI, SAMSI, IPAM) when relevant activities take place. His work is significant.

Currently, he is performing sensitivity analysis with respect to critical parameters, such as oxygen concentration or ratio of mutated phenotypes, Kevin has been using weeks of uninterrupted CPU time with a large amount of memory (RAM)—that is, he is outstanding at developing computational models.

Kevin is likely to become a superstar and his participation on this program would be motivating for him and of importance to the students from African communities. Kevin is Mexican-Philippine American.

Sincerely

A handwritten signature in black ink, appearing to read 'Carlos Castillo-Chavez', with a stylized, flowing script.

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