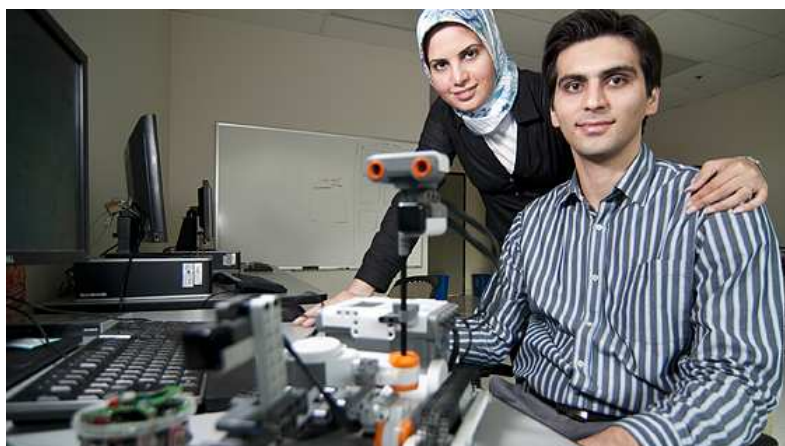




PhD candidate wants to help explore the cosmos

By [Daniel Reid](#) | [Print this article](#) | 0



PhD candidates Shafagh Jafer and husband Mohammad Moallemi are conducting ground-breaking research. (James Park Photo)

What is Mohammad Moallemi's area of research? It deals with robotics applications. And simulations. And computer-based modelling.

The specifics? Well, those are bound to make you short-circuit.

"I'm trying to bridge computer-based modelling and simulation into real-time systems," says Moallemi, who is conducting breakthrough research in the field of mixing simulation with real-time and embedded applications.

Suffice it to say, it's quite complex. But he has managed to find the perfect partner in crime, someone who does fully grasp the complexities of modelling and simulation using parallel computing. His wife, Shafagh Jafer, works on simulations.

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They met at Carleton.

“She was posing an approach to run different kinds of simulations on her cluster computers,” says Moallemi. (She was creating a virtual world and just needed a robot.)

“We put together a proposal where we could interface our methods,” he says. “I interface my robots into her simulation.” (His robots ask her simulator for directions.)

“My robot is moving in a virtual space that’s defined in her simulation.” (It was a match made in virtual heaven.)

He compares it to using a flight simulator — as opposed to flying an actual plane — as a way to run experiments in a risk-free environment.

“We first simulate the flight control system, simulate the environment ... then put it into action as a simulation only,” he says. “I’m trying to use computer-based simulation models to operate in such devices as the actual controller.”

The military is surely watching Moallemi’s work with great interest but he firmly disagrees with having his research used as a weapon.

“I don’t like to build something that is used to kill people,” he says. “(I’d be okay) if there is an application in the military where we can help people ... but applications that are specifically to kill people, I don’t like that.”

Rather, Moallemi would like to see his research used to explore the cosmos. He would love to help with the exploration of Mars, for example, which can be a really costly endeavour.

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If NASA sends an actual robot to Mars, it has to operate autonomously over there. Lots can go wrong and there's always the chance that the robot will never return at all.

It's more cost-effective, he says, to simulate the Mars environment here on Earth and run practical experiments to better know our neighbouring planet.

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