

Inna Sharf, Ph.D., P.Eng.,
Professor and Director, Aerospace
Mechatronics Laboratory
McGill University
Montreal, Quebec, Canada



Inna Sharf, currently a professor in the Department of Mechanical Engineering at McGill, received her B.A.Sc. in Engineering Science, specializing in Aerospace option, from the University of Toronto (1986). Upon completion of the degree, she immediately enrolled in a graduate program at the same institution. She was fast-tracked into a Ph.D. program, which she completed in Aerospace Engineering in 1991 at the Institute for Aerospace Studies, University of Toronto. Thereafter, in January 1991, Sharf joined the Department of Mechanical Engineering at the University of Victoria (UVic) as an Assistant Professor and holder of the NSERC's Women's Faculty Award. Sharf's research activities at that time were focused on the dynamics and modeling of flexible space manipulators, such as Canadarm. The ten years at UVic were interrupted by two maternity leaves in 1995 and 2000 and a sabbatical leave in 1997 which was divided between the Department of Aerospace Engineering at TU Delft (the Netherlands) and Faculty of Aerospace Engineering at the Technion (Israel). After returning to Victoria from sabbatical, Sharf started collaborating with MDA (former Spar Aerospace) on problems related to contact dynamics in space robotic applications: modeling, validation and identification. This led to a multi-year research program in this area, funded by MDA, the Canadian Space Agency (CSA) and NSERC. In the last two years of her appointment at UVic (1999-2001), Sharf worked in collaboration with astronomers at the Herzberg Institute for Astrophysics (NRC-HIA) on the design of a new experimental laboratory for the development of astronomical instruments. This resulted in a multi-million new initiative, which was lead by Sharf and funded through the CFI grant on the design and analysis of astronomical instrumentation.

In 2001, Sharf left University of Victoria to relocate to Montreal where she took up a position as Associate Professor at McGill. The move to another university provided Sharf a unique opportunity to rebuild her research program afresh. Re-energized by the move and motivated by the international efforts in the area of on-orbit servicing of satellites, Sharf started the construction of a unique facility for studying robotic grasping of satellites and debris in space. Since its inception in 2003 to present, the Aerospace Mechatronics Laboratory constructed with funding from NSERC, Canadian Space Agency, IRIS and PRECARN has supported the research of numerous graduate students, visiting trainees and undergraduate students. McGill provided Sharf fertile ground for initiating new projects and collaborations with other colleagues at McGill, at other universities and government agencies. In 2008, Sharf took her second sabbatical in the Faculty of Mechanical Engineering at the Technion where she collaborated with several professors and students on modeling of biomedical devices.

The more recent and substantial collaboration led to her research on navigation and control of small unmanned aerial vehicles (UAVs), with funding from DRDC-Suffield. Sharf is presently participating in the NSERC Canadian Field Robotics Network, as a principal investigator in the group of 11 co-applicants from 8 Canadian Universities. Her contribution to this five-year initiative is to further develop autonomy for small rotary aircraft.

As an educator, Sharf has contributed to educating mechanical engineering students for the past 23 years, at all levels of training: undergraduate, Masters, PhDs, visiting trainees and summer students. She has taught many different courses in the areas of solid mechanics, dynamics, control systems and robotics to thousands

of undergraduate students and hundreds of graduate students to date. Sharf is also active in serving three communities: (i) the scientific community through workshop and conference organization, editorial board memberships and peer review, (ii) the academic community in her department and University through service on academic committees and (iii) the community at large through outreach programs to high-schools, service on company board of directors, public talks and media interviews.

Q. What's the best part of your job?

A. The best part of my job is the opportunity to be constantly learning new things. I never stop learning and being exposed to new challenging technical and scientific problems, new information, and new technologies. I find this to be the most exciting part of my job.

Q. Who inspired you to become a Mechanical Engineer?

A. I was not really inspired to become a Mechanical Engineer per se, but rather to go to University of Toronto for a particular program: Engineering Science. I learned about this program from a friend of mine who was a year ahead of me in high school and ended up getting into Engineering Science at UofT. He told me about the program and it really appealed to me. The rest just unfolded naturally from then on: being in the right place at the right time.

Q. Who (other than family members) do you admire most?

A. I don't have a single person that I admire. I admire women who manage to have successful careers and balance that with family and personal life, raising children and being nice human beings.

I have friends who have succeeded in doing so and I admire them.

Q. What do you feel has been your most important professional accomplishment to date?

A. Training and supervising my graduate students: this part of my job I value the most and I hope that I have contributed at least a bit to my graduate students successes and helped them launch their careers.

Q. If you had not chosen a career in engineering academia, what else would you have done?

A. I really don't know. At one point early on I thought of doing applied mathematics, then also working in industry. Looking back though, I think I am exactly in the right place.

Q. What's one piece of advice you would give to Women in Engineering?

A. Stick with it; be kind to yourself, don't try to compete with men in the profession, just try to do your personal best and enjoy the process, whatever it is.



Draganflyer X8 unmanned aerial vehicle being tested outdoors.