



Chair for Women in
Science and Engineering
BC and Yukon Region



Engineering

Lead Sponsors:



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Westcoast Women in
Engineering, Science
& Technology

My engineering experience:

Travelling with Friends

Dr. Elizabeth Croft



a place of mind

THE UNIVERSITY OF BRITISH COLUMBIA



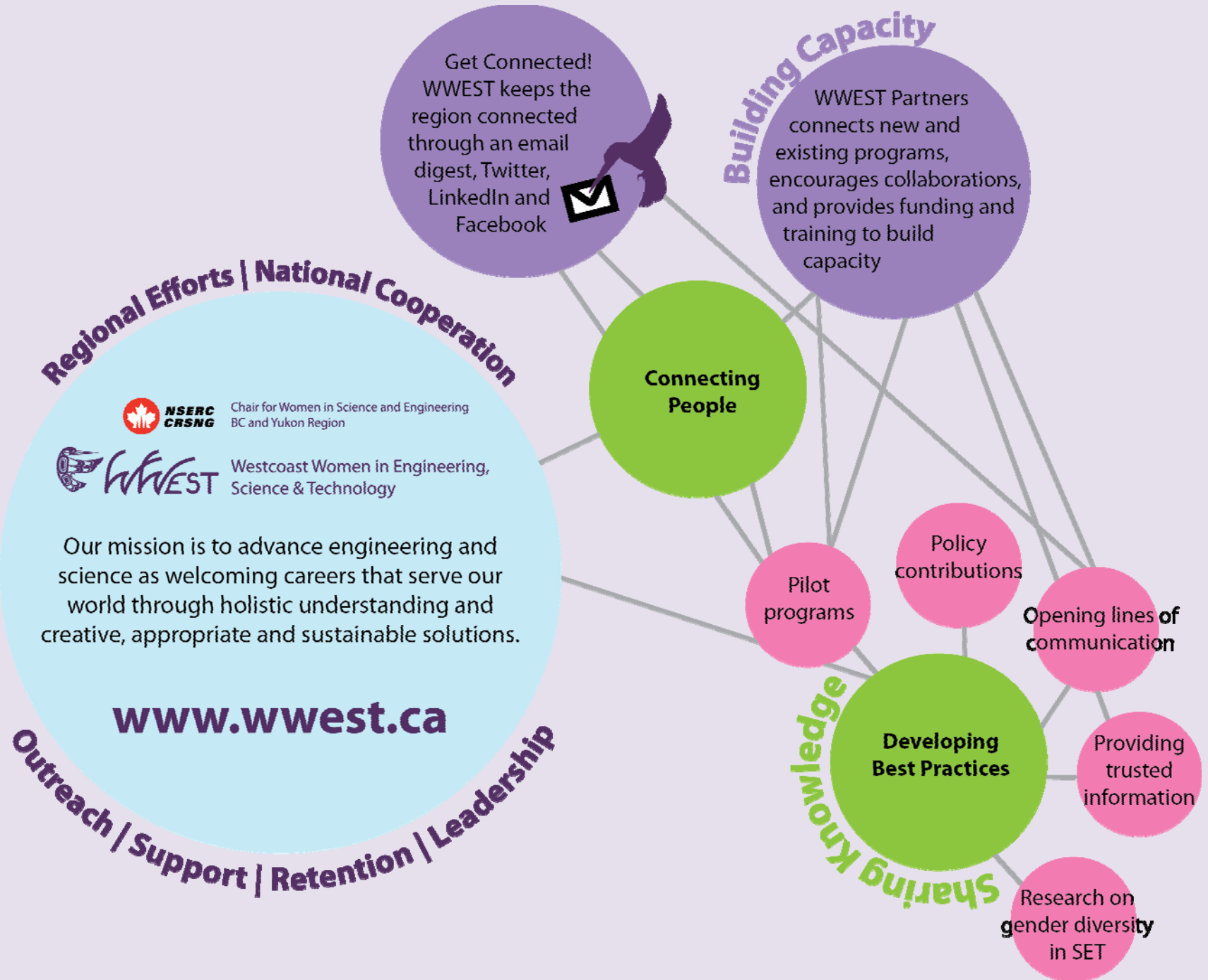
Elizabeth Croft

Ph.D., P.Eng., FASME, FEC

NSERC Chair for
Women in Science and Engineering
BC/Yukon Region

Professor
UBC Mechanical Engineering

Associate Dean, Education and
Professional Development
UBC Faculty of Applied Science



 WVU EST Important to Know

- Washrooms
- Emergency Exit
- Fire Procedure

ENGINEERING:

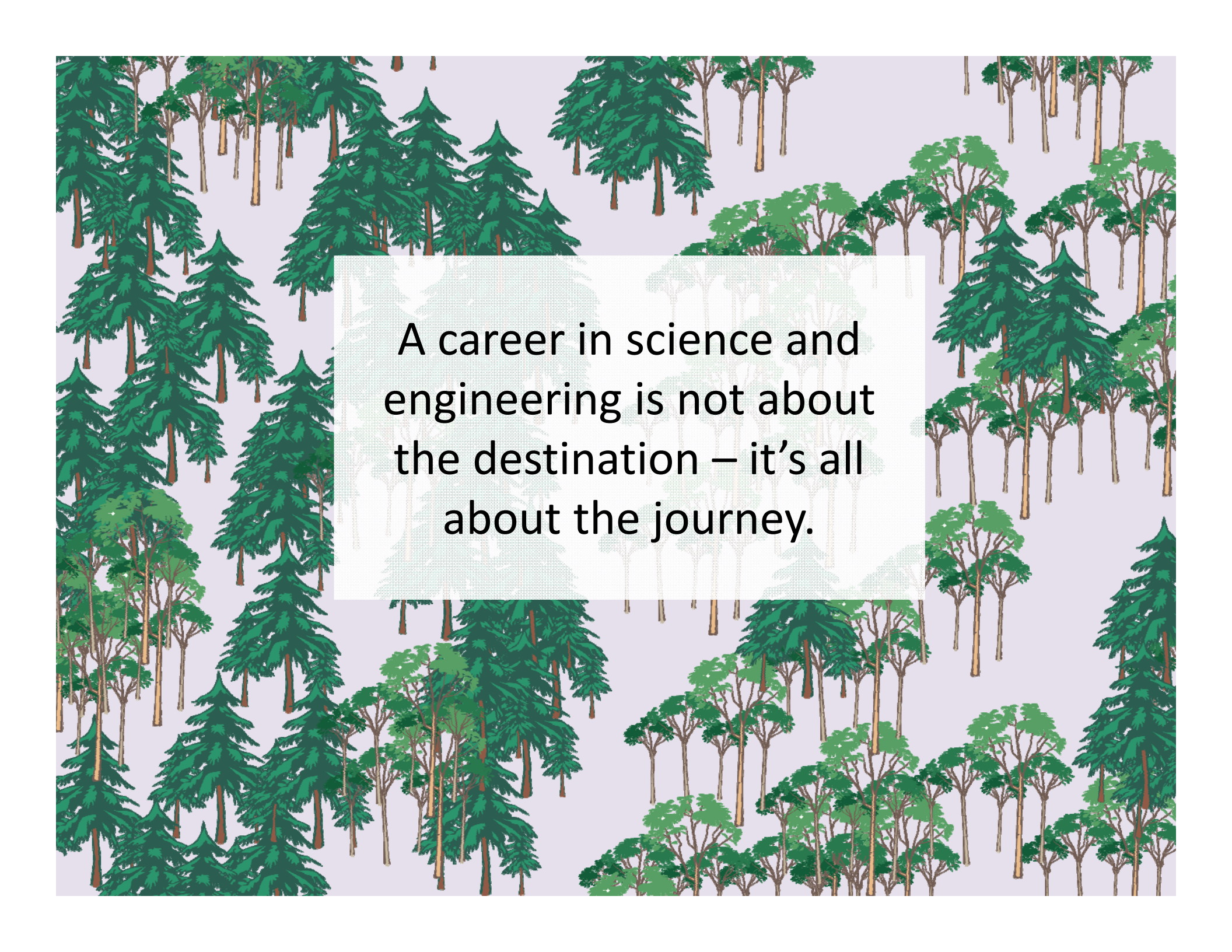
a

creative
engaging
rewarding

profession where **people**

and

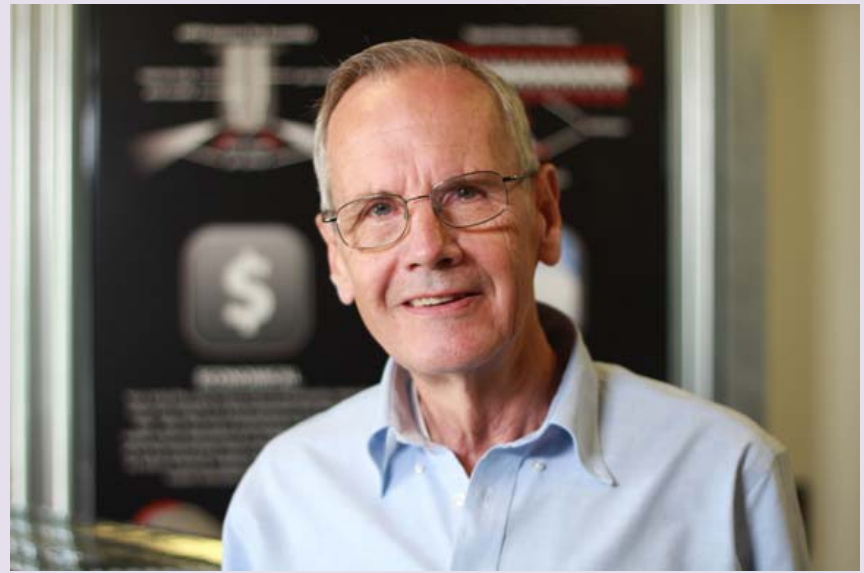
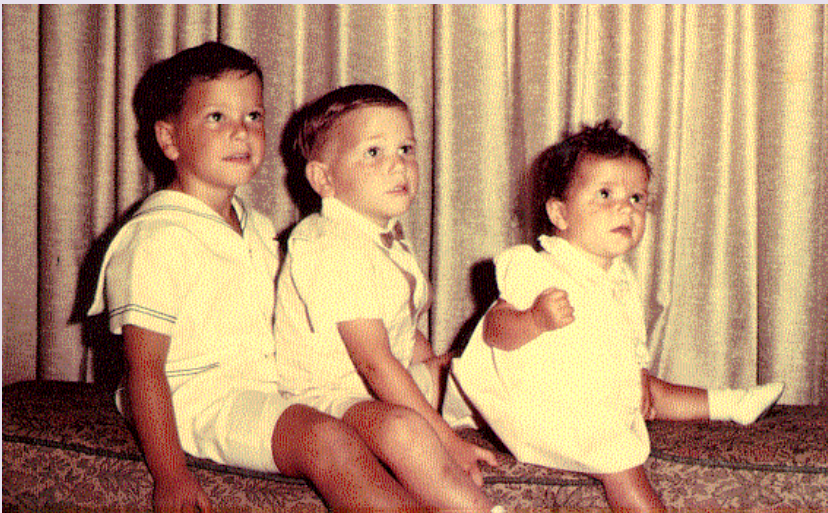
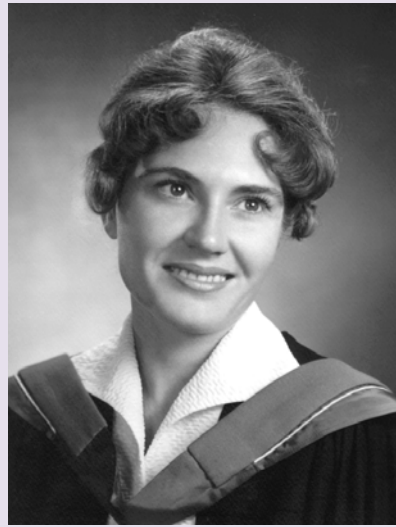
solve problems
design solutions
help local & global communities
love what they do



A career in science and engineering is not about the destination – it's all about the journey.



My Journey





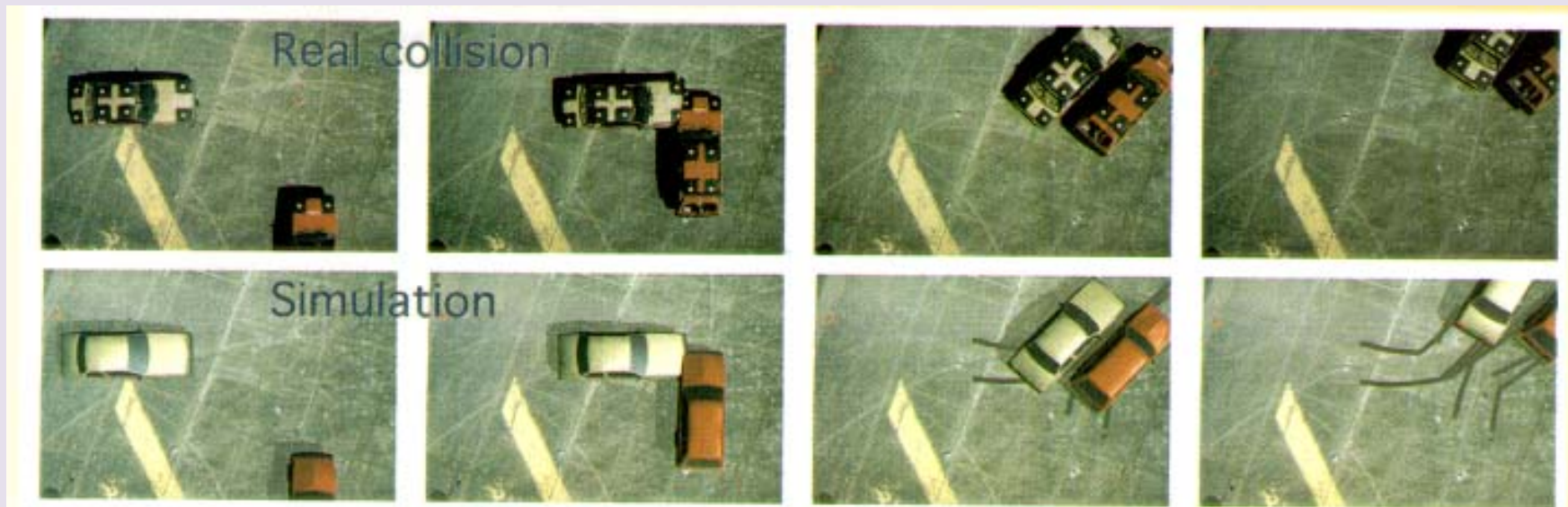
- UBC 1983-1988 - Mechanical Engineering
- Worked hard, played hard. Intramural Athlete of the year 1986, 1987.
- Married another student in 1987
- Key to success: make friends and build a network



Crashing into my first job... (1988-1990)



- Fresh undergraduate with co-op (engineering summer job) experience
- Landed the job in part because I had been in a car accident which had been investigated by the company...







This never happens...





...but this does.





People, people, people

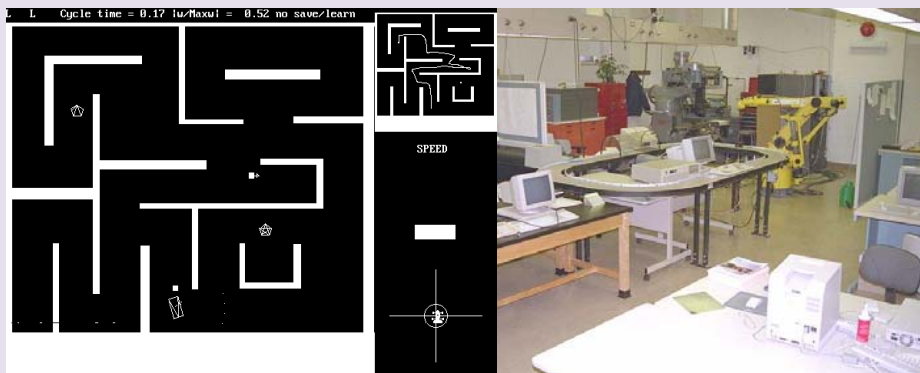
- Senior engineers, co-workers and support staff
- Clients - insurance adjusters, lawyers
- Information sources - police, mechanics, witnesses, medical professionals
- Claimants



Decision Point. Should I change lanes?



A chance to learn about things that interested me, rather than having a set curriculum



M.A.Sc, University of Waterloo, 1992

Neural Network Control of an
Autonomously Guided Vehicle

Ph.D., University of Toronto, 1995

Motion planning for robot arms



And other important happenings...

The best time to have a baby is when you are 40 weeks pregnant.





Back to UBC





Friends along the way



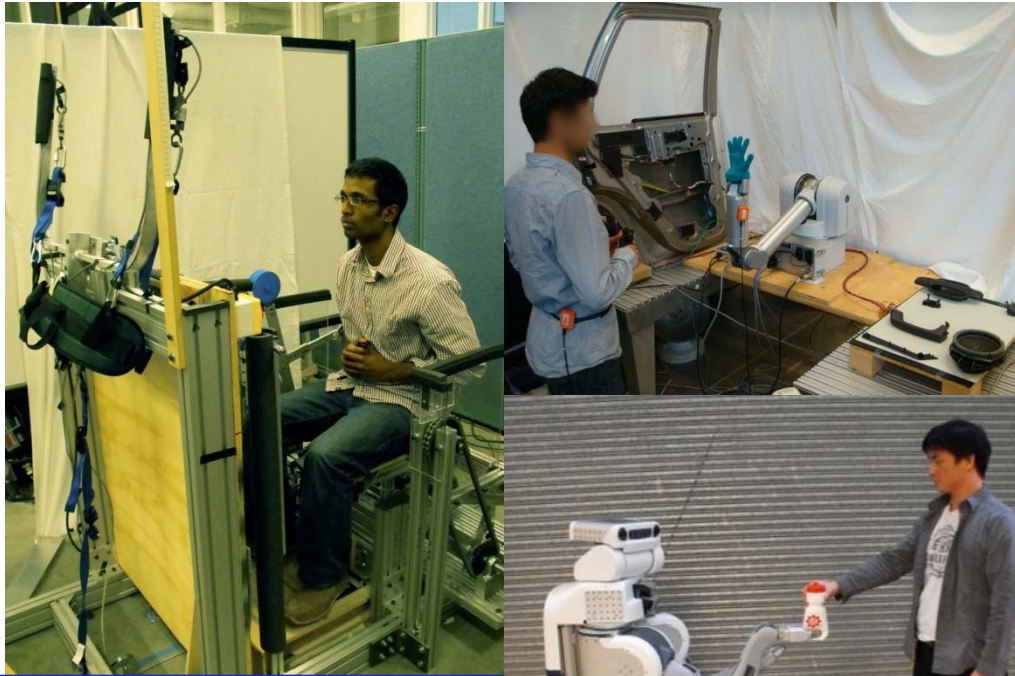
OUR RESEARCH THEME >>>>>> 19

Robots and People Working Together



PEOPLE AND ROBOTS - TOGETHER

»»»»» 20



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Gallery: Rise Of The Helpful Machines

Posted 7.26.10 at 10:06 am 4 Comments

IMAGE 7 OF 10

Riser

John B. Carnell

A Fully Immersive Rehab Robot
Birthplace
University of British Columbia
Occupation
Rehabilitator

Why We Need It
Today's physical-therapy equipment for balance requires stroke victims to have enough strength to stand on their own, but that puts them at risk of more falls and injuries.

How It Works
The RISER (Robot for Interactive Sensory Engagement and Rehabilitation) is the only rehab system that can simulate a wide range of unstable situations while fully supporting a patient's body weight to help him regain his sense of balance after a stroke. Supported by a back brace, a patient stands on a Wii-board-like platform that can move in six directions. Virtual-reality goggles work in sync with the platform to guide users through different simulated activities, such as riding up an escalator or windsurfing. Patients can gradually attempt more-challenging balancing acts to speed up their recovery.

The platform is also a powerful research tool in the quest to better understand the neurobiology of balance. When a patient stands on the platform and experiences a recording of his previous ride, electrodes attached to his scalp give scientists insight into how different brain regions are responding to the experience.

On The Job By
2015



8/18/2015

UBC MECHANICAL ENGINEERING

CFR20

SHARING SPACES

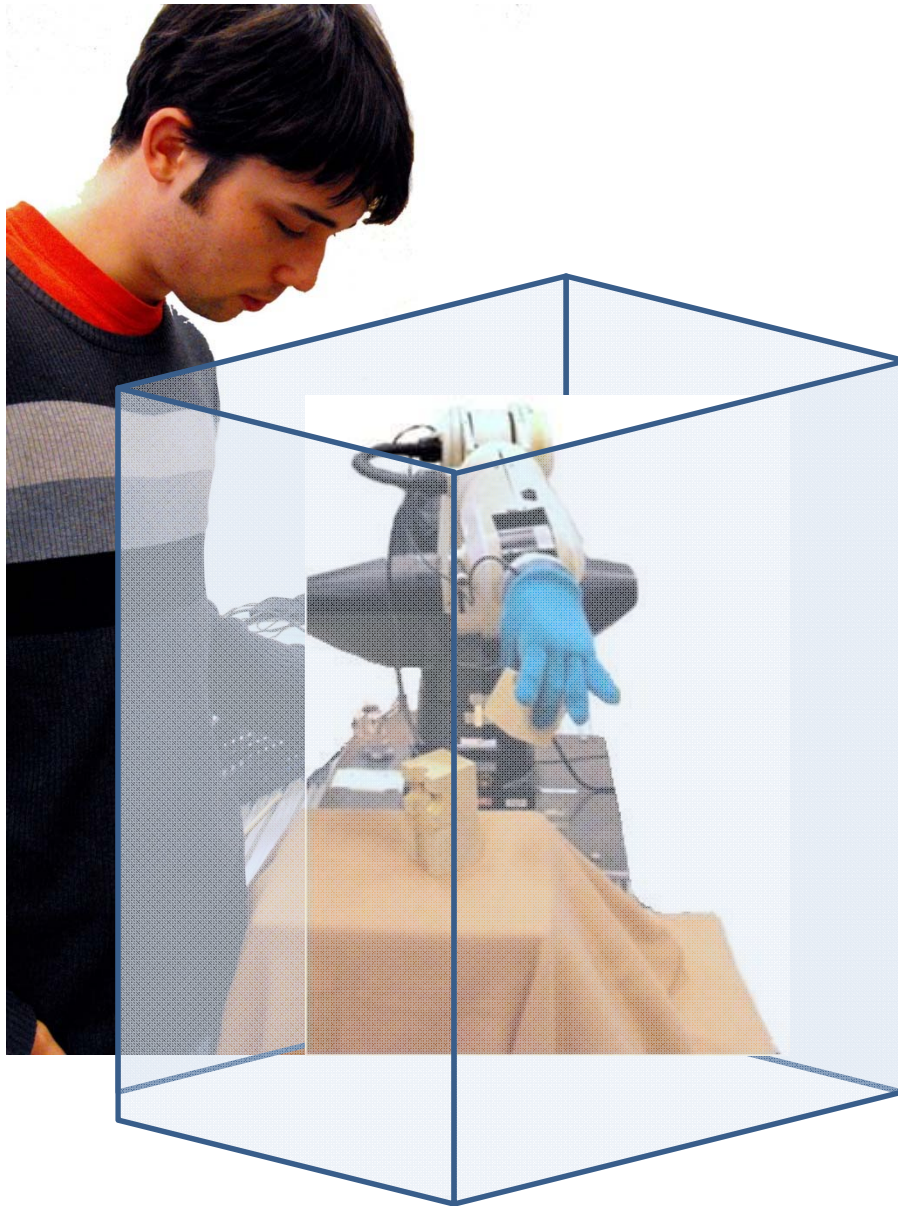
SHARING

Shared Space

Who should yield?

Shared Objects

Who should get the object?



HESITATION:

The elapsed time between the stimulation of an organism and its subsequent response to the stimulus. (LEONARD W. DOOB, 1990)

i.e., the time elapsed in making a judgement about how to respond to a stimulus and responding.

Human-Human Interaction



Human-Robot Interaction

SHARING STUFF



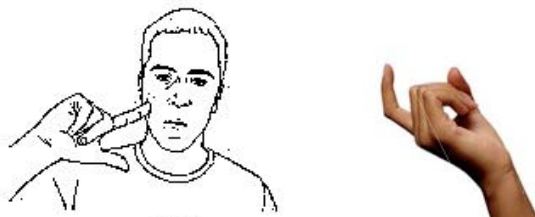
- Characterize the nature of Human-Human handoff (object passing) in order to design controllers for **Human Robot part transfer**
- Identified **specific grip/load cues** related to task role – giver or receiver

COMMUNICATING



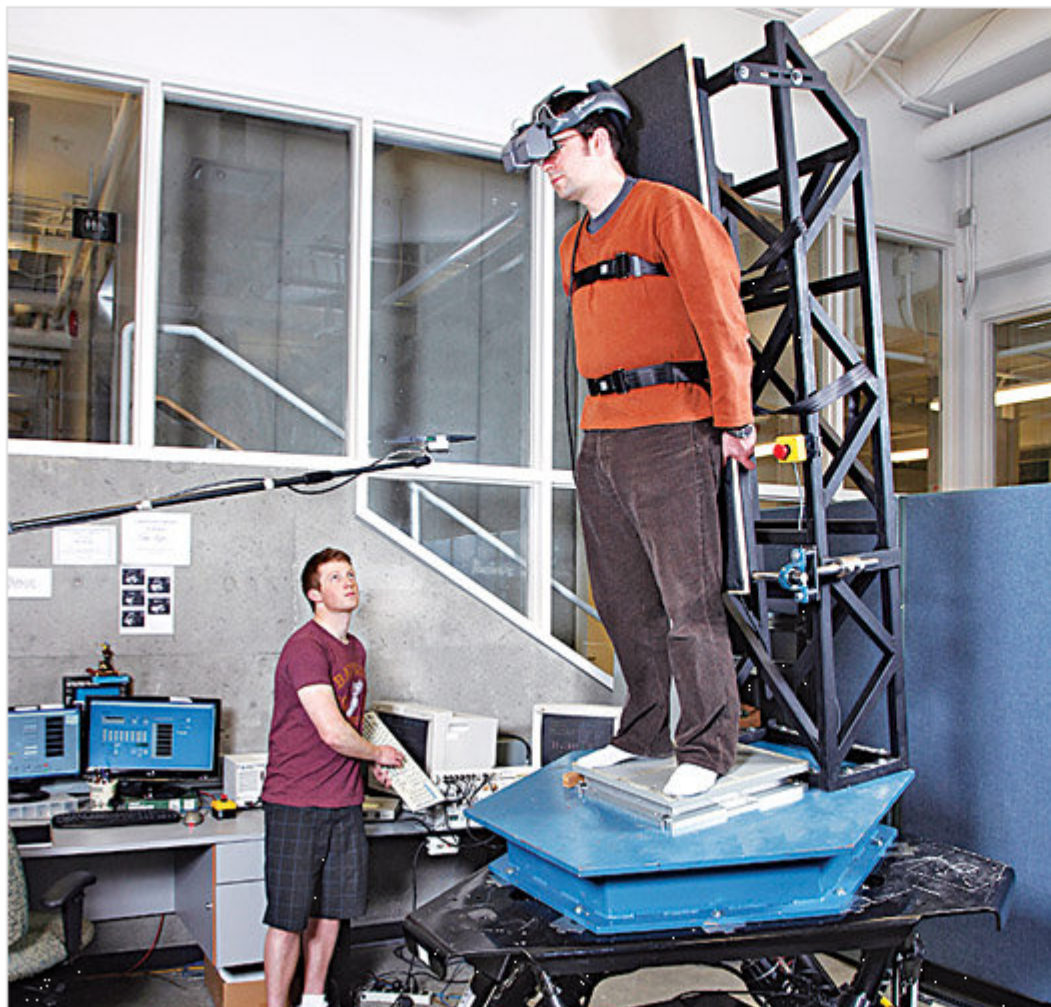
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- In noisy environments, like manufacturing workcells, people and robots can communicate using natural gestures, avoiding challenges of speech recognition



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Gallery: Rise Of The Helpful Machines

Posted 7.26.10 at 10:06 am [4 Comments](#)◀ **IMAGE 7 OF 10** ▶

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WVest Pick your values & set priorities





Look for inspiration



 WVWEST Look for advice



 WVWEST Look for support





Do you remember the first thing I spoke about today (after my name?)

For those who have been in the mining or oil & gas sector, you probably didn't notice.

I'll show you again.

 WVU EST Important to Know

- Washrooms
- Emergency Exit
- Fire Procedure



WV EST Culture Change

- If we want a true change in our profession, we need to change the culture.
- 20 years ago, safety wasn't a cultural value. Now it is everywhere. We made it everywhere.



My Challenge to You

Transform our culture.

One word.

One sentence.

One decision at a time.

www.wwest.ca

(end)