UBC
COMPUTER
SCIENCE: THE
INNOVATION
CONTEXT

SOFTWARE
SYSTEMS
ENGINEERING

AI & MACHINE
LEARNING

GRAPHICS,
ANIMATION &
AR/VR

DATA
SCIENCE

USER INTERFACE
DESIGN &
TECHNOLOGY

OUTPUTS
UBC COMPUTER SCIENCE

- Undergrad program ranked 1st-2nd in Canada (US News, Times Higher Ed, Maclean’s),
- 16th, 24th internationally (US News, QS World)
- 59 faculty (15 joined in last 3 years)
- 2000 Majors students in our programs
- 6907+ alumni in 140 countries
- Exceptional faculty: since 2010, 9 Fellows of ACM, IEEE, Sloan, and FRSC, 10 Discovery Accelerators, 4 Outstanding Young CS Researchers, ++ more
- Producing the top programmers in the world: Only Stanford advances to the ACM World Finals as often as we do.
UBC CS CO-OP

1000+ active CS CO-OP students
880 placements in 2016-17 (33% women)
Many students also majoring in: Math/Statistics, Commerce, Biology
Work 4, 8 or 12 months

SCIENCECOOP.UBC.CA

SAP

amazon

TwoTall totems

Hootsuite

SAFE SOFTWARE
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OUTPUTS
ARTIFICIAL INTELLIGENCE FOR DECISION-MAKING & ACTION

11 FACULTY COVERING ALL ASPECTS OF AI AND MACHINE LEARNING

- Machine learning, including deep learning
- Vision and robotics
- Knowledge representation & reasoning
- Natural language understanding and generation
- Preference elicitation
- Multiagent systems
- Probabilistic programming
- **Applications:** sustainability, education, healthcare, bioinformatics, geology, user interfaces, assistive technology, spectrum allocation

**Diagram:**

- Data
- Bias/Prior
- Learning
- Predictive models
- Constraints/Interventions
- Reasoning
- Causal models
- Preferences
- Planning
- Decisions and actions
OBJECT COUNTING

The CS ML lab's fully-convolutional network architecture beats state-of-the-art across a variety of object counting problems, finding location as well as number of objects with minimal training input.
Training students in:

- Detecting and intervening in fake news
- Information propagation in social networks
- Using data to develop biomarkers to fight against heart, lung, and kidney failure
- Text mining to create natural language summaries to facilitate access to e-mail, blogs, meeting minutes, etc.
- Improving understanding and exploration of recommendations, data provenance, and open data.
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USER INTERFACE DESIGN & TECHNOLOGY
5 faculty training students to deploy new modalities of technology in service of humans:

Using personalization • affective computing • interface technology • interactive visualization • human-robot interaction • haptics • tactile sensing • robotics • AR/VR • on-skin interaction

For education • health • older adults • kids • society
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OUTPUTS
SOFTWARE SYSTEMS ENGINEERING

UNDERSTANDING AND IMPROVING SOFTWARE SYSTEMS TO SCALE WITH THE COMPLEXITY OF MODERN LIFE.

- **Researching** new approaches to help solve fundamental problems associated with building, evolving, and validating software.
- **Training** students to be able to contribute to and improve the modern workplace with cutting edge tools, techniques, and methodologies.
- **Engaging** companies in BC and beyond through collaborations with Tasktop, SAP, Salesforce, ABB, ACL, Shopify, and others.
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OUTPUTS
GRAPHICS, ANIMATION & AR/VR

GRAPHICS, VISION, AND INTERACTION FOR COMPUTATIONAL REALITY

Research and training in
- geometric modeling & design • data-driven modeling
- digital human tracking, capture, simulation
- VR/AR interfaces & design
- sports analytics • human motion modeling • physics-based simulation
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SOFTWARE SYSTEMS ENGINEERING

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OUTPUTS
Total Grad student enrollment over time

MSc in CS  PhD in CS  overall total