SFU SIMON FRASER UNIVERSITY
ENGAGING THE WORLD

A Professional Big Data Master's Program to train Computational Specialists

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Education for Employable Graduates: Critical Questions

- Definitions of Training, Education and Employability.
- What skills, knowledge and capabilities are needed for good employability?
- Have they been formally defined?
- Who defines them?
- How do we define the relevant BDA curricula?
- How do / should we deliver the courses?
- What can we learn from our experience?

Overview

Our goal is to train computational specialists who can *construct models*, *develop algorithms* and *write software* that can *extract actionable knowledge* from Big Data.

- Graduate Program
  - targeted at students who have completed their undergraduate studies in an information technology or scientific field, including professionals
- Small cohort taking 16 months including co-op
  - Traditional graduate course delivery (5 courses) plus specialized lab work (4 courses)

Areas covered: the five pillars

- Systems
  - for storing, computing and managing large-scale data
- Algorithms
  - well-versed in highly efficient algorithms for processing massive data
- Machine learning
- Data mining
  - extract patterns from large-scale data and machine learning
- Visualization
  - present the information obtained from the data to users who can act on this information

Areas covered

- Analysis of scalability of algorithms to big data.
- Data warehouses and online analytical processing.
- Efficient storage of big data including data streams.
- Scalable querying and reporting on massive data sets.
- Scalable and distributed hardware and software architectures.
- Software as a service. Cloud Computing (e.g. Amazon EC2, Google Compute Engine)
- Big data programming models: map-reduce, distributed databases, software for implementing streaming and sketching algorithms.

Areas covered (continued)

- Dealing with unstructured data such as images, text or biological sequences.
- Scalable machine learning methods such as online learning.
- Data mining: methods for learning descriptive and predictive models from data.
- Distributed algorithms over very large graphs and matrices.
- Social media analysis.
- Visualization methods and interactive data exploration.

Hardware and Software Environment

- Premium workstations and displays
  - wide range of commercial visual analytics software
  - in the Vancouver Institute for Visual Analytics (VIVA) lab.
- Amazon compute cloud EC2 / Google Compute Engine.
- Local Hadoop cluster for programming assignments.
- Other cloud computing experimental testbeds already in use at SFU for research.

Tuition

- Domestic students program cost is CAD $26,000 / USD $23,400 over 16 months.
- International students program cost is CAD $31,280 / USD $28,150 over 16 months

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Graduate training on core technical technology and hands-on application to real world problems.

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Five pillars foundational work plus lab work and co-op.
Will evaluate curriculum after each cohort.

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Conducted research and market study. More work needs to be done here.

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Traditional classroom plus tutorial based labs.

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In progress. Very popular, and attracting high quality applicants.

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