

# Ian Smith

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## Summary

I provide technical leadership to an engineering team in the domain of supply chain risk analysis within Intertek's Kanata office which enables the Global Restricted Substances (GRS) group. I have built solutions for Business process automation, data pipelines, web-based tools for supply chain risk assessment, and scraping web repositories to obtain research data I interpret the results of the findings and communicate directly to stakeholders — customers, my internal organization, and the public.

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## Technical Skills

**Technologies:** Python (Pandas, Requests, Scikit-learn, NumPy, Flask, matplotlib, Plotly), SQL, Java, Javascript, R, Jupyter Notebooks

**Applications:** Data pipelines and ETL, Web scraping, Machine learning, Natural language processing, Web apps, Mathematical and Statistical models, Business-domain research

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## Professional Experience

### Intertek

GLOBAL RESTRICTED SUBSTANCES — OTTAWA, CANADA

#### Engineer

October 2009 – present

Intertek is a global auditing, testing, and certification service provider. Designed and implemented a configurable risk analysis platform for worldwide chemical regulatory compliance. Mine and analyze data to keep up to date on enforcement and risk trends. Automate business processes. Mentor junior team members.

### Ageus Solutions

OTTAWA, CANADA

#### Engineer

January 2005 – October 2009

Ageus Solutions was a successful independent consulting startup which was integrated into Intertek Health and Environmental after acquisition. One of the founders of the company. Served on board of Directors and as a corporate officer. Responsible for legal due diligence during M&A. Designed core analytical services and directed team of regulatory researchers.

### Nortel Networks

OPTICAL COMPONENTS — OTTAWA, CANADA

#### IC Designer

June 2000 – December 2004

The former Nortel Optical Components Group designed and fabricated GaAs ICs for use in optical long haul equipment. Analyzed integrated circuits and discrete semiconductor devices for root-cause of failure. Assembled and ran laboratory at minimal cost during downsizing. Experimentally demonstrated recurring failure mechanisms. Advised manufacturing operations to implement corrective action.

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## Education

### Carleton University

OTTAWA, CANADA

#### Bachelor of Computer Science, Honors

2018

With High Distinction. Data management, AI, and software engineering. Web and mobile application development. Computer Vision. Awarded Senate Medal for Outstanding Academic Achievement

### University of Manitoba

WINNIPEG, CANADA

#### B.Sc. (Electrical Engineering)

1999

Focused on microelectronics and VLSI design. Acquired proficiency in IC design tools, statistics and mathematics, MATLAB, and C++.

### Udacity

#### Data Scientist Nanodegree

Pending

CRISP-DM PProcess, Supervised learning, Unsupervised Learning, Deep Learning, Stakeholder Communication, Experimental Design, Software Engineering, ETL Pipelines, NLP Pipelines

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## Professional Projects

### Risk Analysis Application

**Purpose:** Analyze a client's supply chain for material risks. Machine learning algorithm determines the types of materials based on text. Renders a tabular report with recommended testing plan or design revisions, to assist a material science SME. For a complex product, this allows a client to apply chemical testing in a cost-effective manner.

**Results:** Reduced a multi-week engineering workflow to hours. 718 successful customer-projects to date.

**Technology:** Python, SQL, Javascript

### Material Risk Knowledge Base

**Purpose:** Periodically mines product recall and litigation repositories to obtain up-to-date chemical infraction data set. Cleans and transforms raw HTML and XML, processes free text, and stores results in SQL repository.

**Results:** Intertek maintains an industry-leading knowledge base on current uses of 723 regulated chemicals, and in which materials or products.

**Technology:** Python (Pandas, Requests, NLTK), Java, SQL

### ETL Pipelines

**Purpose:** Automates customers' product design encodings and results of conformity assessments from various sources. Maps schemas, cleans data, stores in engineering SQL database

**Results:** Intertek is able to accept product conformity data from in-house sources, third-party service providers, or customers, and deliver a consistent, repeatable analysis product.

**Technology:** Python, SQL

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## Academic Projects

### Value-Investor Stock Analyzer

**Purpose:** Built to investigate fundamental analysis at a time when "value investing" was out of style and "value stocks" were depressed in price. It uses a regression learner trained on fundamentals, and predicts opportunity five-year returns. The Shiny framework provides the user with a convenient web UI.

**Results:** Exceeded the S&P/TSX Composite Index one-year return by 4.6% for 2018

**Technology:** R, SQL, Javascript

### Carleton University Honors Project

**Purpose:** Uses Natural Language Processing to extract product structure and composition from free text obtained from industrial designs. Implemented in C++.

**Results:** Portions of this project suitable for deployment in an industrial setting, as part of Intertek's Risk Analysis Application. The project was awarded a grade of A+.

**Technology:** C++, Machine Learning, Natural Language Processing, NLTK API (As part of the academic requirement, I wrote the NLP from scratch in C++)

### Udacity Deep-Learning Project

**Purpose:** Classify the Oxford "Flowers" dataset by species using a convolutional neural network. Accuracy 77%

**Technology:** Pytorch, Deep neural networks, Computer vision

### Udacity Supervised Learning Project

**Purpose:** Evaluated Random Forest, Adaboost, Bayesian Classifiers in scikit-learn using the California Census dataset. Accuracy 0.8671,  $F_1$  0.7433

**Technology:** Python, Jupyter Notebooks, scikit-learn