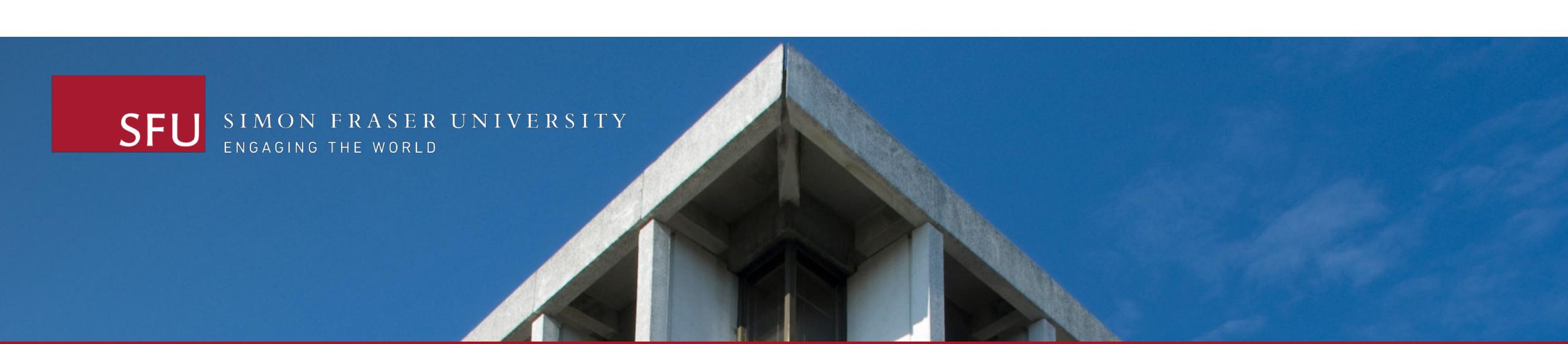




SFU

SIMON FRASER UNIVERSITY  
ENGAGING THE WORLD



# How do I become a ...

Presented to you by:

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Grace Kingsly | Mohammad Ullah

# Don't you want to know?

## 9 Must-have skills you need to become a Data Scientist, updated

<https://www.kdnuggets.com/2018/05/simplilearn-9-must-have-skills-data-scientist.html>

To become a data scientist, you could earn a Bachelor's degree in Computer science, Social sciences, Physical sciences, and Statistics. The most common ...

## How to Become a Data Scientist | GetEducated

<https://www.geteducated.com/careers/how-to-become-a-data-scientist>

There are three general steps to becoming a data scientist: Earn a bachelor's degree in IT, computer science, math, physics, or another related field; Earn a master's degree in data or related field; Gain experience in the field you intend to work in (ex: healthcare, physics, business).

## What's The Best Path To Becoming A Data Scientist? - Forbes

<https://www.forbes.com/sites/quora/.../whats-the-best-path-to-becoming-a-data-scientis...>

Jan 20, 2017 - How can I become a data scientist? This question was originally answered on Quora by Monica Rogati.

## Becoming a Data Scientist: Step by Step Guide

<https://www.learnhowtobecome.org/data-scientist/>

Data science is hot right now. According to the University of Wisconsin's data science department, job postings in the field increased by a multiple of five ...

## Software Engineering Degrees & Careers | How to Become a Software ...

<https://www.learnhowtobecome.org/computer-careers/software-engineering/>

Steps to Becoming a Software Engineer. Get an Education. Completing a formal education is the first step toward becoming a software engineer. Do an Internship. Pursue a Specialization. Pursue Entry-Level Career Opportunities. Get Certified. Attend Conferences. Earn a Graduate Degree.

## How to Become a Social Media Manager | Career Advice & Interview ...

<https://www.wayup.com/guide/become-social-media-manager/>

If you spend hours crafting your Snapchat story and have an interest in capitalizing on media trends, becoming a social media manager might be the job for you.

## What Skills Do I Need to be a Social Media Manager? | Digital ...

<https://digitalmarketinginstitute.com/.../2017-8-8-what-skills-do-i-need-to-be-a-social-...>

Aug 8, 2017 - Do you have goals of becoming a social media manager? Not sure where to start? This blog will outline the skills you need to succeed in this ...

## Become a Location Independent Social Media Manager in 2019 ...

<https://www.udemy.com/become-a-kick-ass-social-media-manager/>

With this quote in mind, I created this course to provide you with the tools and techniques you need to become an awesome social media manager, and help you ...

**“FOR COMPANIES AND THEIR  
EMPLOYEES TO SUCCEED, THEY  
NEED TO FOCUS ON BUILDING  
SKILLS FOR THE FUTURE”**

David Blake, Degreed Cofounder  
Kelly Palmer, Degreed CLO



# Not just us

- Company HR
- University
- EdTech companies
- LinkedIn etc.

All has a reason to know

# Our approach



→ Scrape → Clean and integrate → Analyze

# Our approach (cont.)

- Preliminary search on various job titles (titles from O\*NET Database)
  - Over various industries (NAICS classification)
  - Attempt to diversify collected job title
- Choose 10 - 20 job titles that yields highest # of resumes in preliminary search
  - Some examples: Software Engineer, Cook, Financial Manager, Host, Hair Stylist
- Focusing on Canada, considering US

# Current challenge

```
skills" : [
  {
    "skill" : "COBOL",
    "experience" : "10+ years"
  },
  {
    "experience" : "10+ years",
    "skill" : "UNIX"
  },
  {
    "experience" : "10+ years",
    "skill" : "TESTING"
  },
  {
    "experience" : "10+ years",
    "skill" : "KERNEL"
  },
  {
    "skill" : "TANDEM",
    "experience" : "10+ years"
  },
  {
    "experience" : "Less than 1 year",
    "skill" : "System Analyst"
  }
],
"jobs" : [
  {
    "details" : [
      "Singapore",
      "* Production Support 24/7: Supporting applications running in Unix and Tandem (Hp-",
      "Nonstop) Platforms. Main tasks is to perform monitoring and investigation of application",
      "issues that has been discovered, detected and issues reported by the end users.",
      "Investigation involves checking the application logs, configuration, objects, running some",
      "queries to check some related tables and replication of issues in test environment.",
      "Escalation to application vendor and System",
      "Engineer",
      "as necessary and update relevant",
      "stake holders.",
      "* Project support: Assigned in several projects that required technical/functional skills. These",
      "involves analysis, programming, system integration testing, user testing support",
      "implementation and production support under Tandem(Hp-Nonstop)/Cobol.",
      "* Change requests support: Handles change request from various applications systems",
      "(Remittance, Swift, Fax, Trade, Internet Banking). The job involves evaluation, costing, effort.",
      "supervision, administration, coordination, development, testing and implementation.",
      "* Performance Testing Support: Performing HP Load runner scripting, running and analysis on the business process of various bank applications.",
      "* Test Environment Support: Handles system environment support to Unix, HP-NonStop and",
      "AS400 servers. Maintain system availability.",
      "ENVIRONMENT: HP Loadrunner, COBOL 74/85, Requester/Server, MQ, Unix scripting, UNIX",
      "TANDEM NonStop Kernel Guardian (D20 / D30), TANDEM Pathway Applications, SOA, MQ",
      "Control-M."
    ],
    "title" : "Senior System Analyst",
    "company" : "Overseas Chinese Banking Corporation",
    "end_date" : "January 2018",
    "start_date" : "January 2006"
  }
]
```

Structured skills ←

Unstructured skills ←

Job title normalization

Skill normalization

Currently looking into:

- Named Entity Recognition
- Named Entity Normalization
- Heuristics
- Skills ML and Open Skills API(<http://dataatwork.org/>)

# Future task

- Skills and job normalization
- Answer questions like:
  - What are common/uncommon skills for a job
  - What are the most relevant skills for a job (e.g most present, Pearson's correlation matrix, distribution)
  - Commonly shared skills among jobs
- Skills-job advisor model

# Skills-job Advisor Model

Premise: There are times where the required skills are unclear/unknown to a person. Often enough that economies of scale is a factor along with soundness.

Idea:



# Considered Models

## Unsupervised

- Cluster similar sets of skills
- Assign clusters to some job title (through inspection)
- Take representative of cluster, Y, and given skill set X and take the skill gap difference between Y and X as advice

## Supervised DL

- Use a GAN to change given skills X to a set of skills Y appropriate for target job T
- Take the skill gap difference between Y and X as advice
- Reference Idea:  
<https://arxiv.org/pdf/1712.02328.pdf>

# Modeling Challenges

- Feature engineering
- High dimensionality and meaning of features
- What is a good advice for skills and jobs? Is there an appropriate ‘advice measurement’?
- Finding comparable work
- DL research and references focuses on images and videos, transfer application problem

# Long road

There is much to be done and we have only touched the surface but we are excited

**“HARD IS TRYING TO REBUILD YOURSELF, PIECE BY PIECE, WITH NO INSTRUCTION BOOK, AND NO CLUE AS TO WHERE ALL THE IMPORTANT BITS ARE SUPPOSED TO GO”**

Nick Hornby, Writer