AI Salary Dashboard

A comprehensive salary negotiation and market analysis handout for AI Engineers in Canada. This dashboard provides data-driven insights into salary ranges, career progression, market demand, and skill evolution.

Created by: Nouhayla Benhammou
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Project Overview

This dashboard is designed as a **salary negotiation reference handout** for AI Engineers. It provides: - Market benchmark data for AI engineer salaries - Career progression pathways - Key performance indicators (KPIs) - Visualization of salary distributions, demand trends, and investment opportunities

The dashboard consists of three main tabs: 1. **Benchmark AI Market** — Market overview and salary analytics 2. **Contribution**

Dashboard — Personal project contributions and skill evolution 3.
Negotiation Summary — Negotiation reference guide (placeholder)

Data Sources

Role Evolution & Career Progression Data

Sources: O*NET, BLS, Wikipedia (Retrieved: January 11, 2026)

- **O*NET (Occupational Information Network)**
  URL: https://www.onetonline.org/link/summary/15-1252.00
  Description: US Department of Labor's comprehensive occupational database. Provides standard job titles, responsibilities, and typical career progression for software developers and related roles.
- **BLS (Bureau of Labor Statistics) - Occupational Outlook Handbook**
  URL: https://www.bls.gov/ooh/computer-and-information-technology/software-developers.htm
  Description: US government labor statistics providing employment trends, job growth projections, and typical career paths for software developers.
- **Wikipedia - Software Engineering**
  URL: https://en.wikipedia.org/wiki/Software_engineering
  Description: General software engineering discipline reference including SWEBOK (Software Engineering Body of Knowledge) notes on staff engineer roles.

Salary Data

Basis: Research-based estimates for Montreal/Canada AI Engineer roles
Data Type: Sample/Representative data for market analysis

Geography: Montreal, Toronto, Vancouver, Remote
Experience Levels: Intern to Executive (0–30 years)

Files: - `data/ai_geo.csv` — Salary by geography (Min/Avg/Max) - `data/exp_23.csv` — Detailed salary table for 2–3 years experience - `data/industry.csv` — Salary by industry sector - `data/exp_position_sector.csv` — Salary by experience, position, and sector

Skill Evolution Data

File: `data/technical_skills_evolution.csv`
Description: Proficiency progression (0–9 scale) across 8 key AI/ML skills over time
Skills Tracked: - Python - Machine Learning - Deep Learning - MLOps - Data Engineering - Cloud AWS - Natural Language Processing (NLP) - Computer Vision

Market Trend Data

File: `data/timeline.csv`
Description: AI job market trends and salary projections (2020–2030)

Dashboard Tabs

Tab 1: Benchmark AI Market

Market overview with 15+ visualizations showing salary ranges, demand, and career progression.

Tab 2: Contribution Dashboard

Personal profile evolution featuring: - Project contribution breakdown - Technical skills evolution timeline - Skills by stream (client/internal/FinLabs)

Tab 3: Negotiation Summary

(Placeholder for future content)

Chart-by-Chart Breakdown

KPI Strip (Top of Tab 1)

Type: KPI Indicators
Data Source: Aggregated salary data
Purpose: Quick snapshot of key salary metrics (CAD) including median, percentiles, and salary ranges for Montreal AI Engineers
Use Case: Dashboard header reference for quick lookups

Industry Share

Type: Pie Chart
Data Source: `data/industry.csv`
Purpose: Shows the composition of AI Engineer roles by industry sector in the dataset
Insight: Identifies which industries dominate the AI job market
Use Case: Understand industry distribution when comparing salary benchmarks

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AI Investment by Industry

Type: Bar Chart
Data Source: `data/timeline.csv` / Research data
Purpose: Displays AI investment levels (Billion USD) by industry sector
Insight: Shows where AI funding and opportunities are concentrated globally
Use Case: Identify growth sectors and potential career opportunities

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Career Progression by Years

Type: Horizontal Timeline Bar Chart
Data Source: `data/role_evolution_sourced.csv` (O*NET, BLS, Wikipedia)
Purpose: Maps 6 career levels to years of experience: - **Intern:** 0–0.5 years - **Entry/Junior:** 0.5–3 years - **Mid:** 3–5 years - **Senior:** 5–8 years - **Principal/Lead:** 8–12 years - **Executive:** 12–30 years

Titles Included: - Intern; Research Intern; Co-op - Junior Software Engineer; Associate ML Engineer; ML Engineer I - Software Engineer; ML Engineer; Applied ML Engineer - Senior Software Engineer; Senior ML Engineer; Staff Engineer - Principal Engineer; Lead ML Engineer; Engineering Manager - Director of Engineering; VP of Engineering; Head of ML

Insight: Typical corporate ladder for AI professionals
Use Case: Determine appropriate role title based on experience level

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Avg Salary by Geography

Type: Interactive Map/Choropleth
Data Source: `data/ai_geo.csv`
Locations: Montreal, Toronto, Vancouver, Remote

Purpose: Compare average AI Engineer salaries across Canadian geographies
Insight: Geographic salary premium/discount (Toronto/Vancouver higher, Remote lower)
Use Case: Negotiate salary based on location; understand cost-of-living adjustments

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Min/Avg/Max Salary Distribution

Type: Grouped Bar Chart
Data Source: `data/ai_geo.csv`
Purpose: Shows salary range (minimum, average, maximum) for each geography
Insight: Visualizes salary spread and variability by location
Use Case: Understand realistic salary floors and ceilings for each region

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Experience Progression

Type: Line/Area Chart
Data Source: `data/exp_position_sector.csv`
Purpose: Salary progression trajectory by years of experience and location
Insight: Expected salary growth curve for AI engineers
Use Case: Forecast your career earnings and identify underperformance

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Salary vs Experience

Type: Scatter Plot with Trendline
Data Source: `data/exp_position_sector.csv`

Purpose: Individual salary points plotted against experience, with regression line
Insight: Shows where you sit relative to peers
Use Case: Identify outliers (over/under-compensated) and benchmark your salary

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Salary Percentiles

Type: Box Plot / Percentile Chart
Data Source: Aggregated salary data
Percentiles: 10th, 25th (Q1), 50th (Median), 75th (Q3), 90th
Purpose: Understand your salary position within the distribution
Insight: Where does your salary rank among peers?
Use Case: Salary negotiation anchor — aim for 75th percentile or higher

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Total Compensation (2–3 yrs)

Type: Violin Plot
Data Source: `data/exp_23.csv`
Purpose: Shows distribution of total compensation (salary + bonuses + equity) for 2–3 year experience level
Insight: Account for non-salary components in total package
Use Case: Negotiate equity and bonus structure, not just base salary

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Salary Details (2–3 yrs)

Type: Data Table
Data Source: `data/exp_23.csv`
Purpose: Detailed breakdown of salary components for early-career AI engineers

Columns: Base Salary, Bonus, Equity, Total Compensation, Percentile
Use Case: Detailed reference for 2–3 year salary negotiations

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AI Demand Timeline

Type: Line Chart (2020–2030)
Data Source: `data/timeline.csv`
Purpose: AI job posting growth index from 2020 to 2030
Insight: Market demand trajectory and future opportunities
Use Case: Understand long-term market trends; validate career choice

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AI Salary Projection

Type: Line Chart (2020–2030)
Data Source: `data/timeline.csv`
Purpose: Forecasted average AI engineer salary growth (CAD) over 10 years
Insight: Expected salary appreciation year-over-year
Use Case: Plan long-term career compensation and negotiate future increases

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Role Evolution — Titles by Years

Type: Horizontal Bar Chart
Data Source: `data/role_evolution_sourced.csv`
Purpose: Same as "Career Progression by Years" but focused on job titles
Titles: Lists typical corporate titles for each role level
Hover Data: Shows exact year range for each position

Use Case: Understand title progression; ensure you're tracking career level appropriately

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Technical Skills Evolution (Tab 2)

Type: Multi-line Plotly Chart
Data Source: `data/technical_skills_evolution.csv`
Skills Tracked (8): 1. Python 2. Machine Learning 3. Deep Learning 4. MLOps 5. Data Engineering 6. Cloud AWS 7. Natural Language Processing 8. Computer Vision

Proficiency Scale: 0–9 (Novice to Expert)
Time Period: June 2019 – January 2025
Purpose: Visualize skill progression over time
Insight: Identify fastest-growing and most important skills
Use Case: Skill development planning; identify gaps in profile

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Project Contributions (Tab 2)

Type: Histogram (Chart.js Canvas)
Data Source: Hardcoded contribution counts
Purpose: Breakdown of project contributions by stream: - **Client Projects:** External client work - **FinLabs:** Internal financial/ experimental labs - **Internal Builds:** Internal company projects

Total: 8 projects (1 client, 2 FinLabs, 5 internal)
Use Case: Personal portfolio summary; demonstrate breadth of experience

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Skills by Stream (Tab 2)

Type: Histogram with Skill Pills

Data Source: Custom skill list by stream

Purpose: Categorize and display skills by project type

Use Case: Showcase specialized skills for different contexts

Running the Dashboard

Prerequisites

- Python 3.8+
- Required packages: pandas, plotly, matplotlib, seaborn, nbconvert

Installation

```
cd /home/nouhayla/AI_Salary_Dashboard
pip install pandas plotly matplotlib seaborn nbconvert
```

Start the Server

```
python3 -m http.server 8000
```

Then open your browser to: **http://localhost:8000/salaryhandouttabs.html**

Generate/Regenerate Charts

```
# Generate role evolution chart
python3 scripts/generate_role_evolution.py

# Generate position progression chart
python3 scripts/generate_position_progression.py
```

```
# Generate technical skills evolution
python3 scripts/generate_tech_skills.py

# Run full Jupyter notebook (all charts)
jupyter notebook dashboard.ipynb
```

File Structure

```
AI_Salary_Dashboard/
├── README.md                              (This file)
├── salary_handout_tabs.html               (Main dashboard HTML)
├── dashboard.ipynb                        (Jupyter notebook with analysis)
├── data/
│   ├── role_evolution_sourced.csv         (Role titles by years - sourced)
│   ├── ai_geo.csv                         (Salary by geography)
│   ├── exp_23.csv                         (2-3 years salary details)
│   ├── industry.csv                       (Salary by industry)
│   ├── exp_position_sector.csv            (Experience vs position vs secto
│   ├── technical_skills_evolution.csv     (Skill proficiency over time)
│   ├── timeline.csv                       (Market trends 2020-2030)
│   └── role_evolution_ai_roles.csv        (Legacy mock data)
├── scripts/
│   ├── generate_role_evolution.py         (Role titles chart)
│   ├── generate_position_progression.py (Career progression chart)
│   ├── generate_tech_skills.py            (Technical skills evolution)
│   └── generate_visuals.py                (Other chart generators)
└── handout/
    ├── kpis.html                          (KPI strip)
    ├── geo.html                           (Geography salary map)
    ├── industry_share.html                (Industry pie chart)
    ├── vis3_salary_distribution.html      (Min/Avg/Max bars)
    ├── exp_progression.html               (Experience progression line)
    ├── salary_vs_exp.html                 (Salary vs experience scatter)
    ├── percentiles.html                   (Salary percentiles)
    ├── total_comp.html                    (Total compensation violin)
```

```
    ├── vis5_2_3_years_table.html       (2-3 years detailed table)
    ├── vis6_ai_demand_timeline.html    (Job posting growth)
    ├── vis7_salary_projection.html     (Salary forecast)
    ├── vis8_investment_by_industry.html (AI investment by industry)
    ├── role_evolution.html             (Role titles by years)
    ├── position_progression.html       (Career progression timeline)
    └── technical_skills_evolution.html (Technical skills line chart)
```

Data Attribution & Disclaimer

Real Data Sources: - Role evolution titles and career levels sourced from O*NET, BLS, and Wikipedia - Career progression milestones based on industry standards

Sample Data: - Salary figures are representative estimates for Montreal/Canada AI Engineer roles - Used for demonstration and analysis purposes - Should be validated with current market data (Levels.fyi, Blind, Glassdoor) before actual negotiations

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Author & Contact

Created by: Nouhayla Benhammou
Purpose: Salary negotiation reference handout for AI Engineers
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