

Where Will the CS+X Jobs Be in 2023?

Paul K. Wolber, Ph.D.

Agilent Technologies

Current Trends: AI

- Peter Norvig (Director Of Research, Google) predicts that application development will increasingly involve training an AI, not “traditional” coding or algorithm development
 - Experience with AI tools needed (CS)
 - Experience with developing & using training data sets needed (Data Science/Stats)
 - Knowledge of the target domain (“X”) very helpful
- Some Hot Areas
 - Autonomous vehicles (+ Engineering)
 - Biomedical (+ Medicine/Biology/Chemistry/...)
 - Natural Language processing (+ Linguistics/Liberal Arts/Law)

Current Trends: Data Science

- Data Scientist: a coder who knows more statistics than most coders & a statistician who knows more coding than most statisticians...
 - Data Science is intrinsically interdisciplinary
- By their own reckoning, good data scientists spend > 50% of their time “cleaning” data
 - Some domain knowledge (“X”) helps!
- Current Data Science suffers from implicit bias issues (see “Weapons of Math Destruction” by Cathy O’Neil)
 - Some co-training in Ethics could help here...
 - Increased workforce diversity would also help...

Top Programming Languages, 2017

IEEE

1. Python	🌐 🖥️	100.0
2. C	📱 🖥️ 🖨️	99.7
3. Java	🌐 📱 🖥️	99.4
4. C++	📱 🖥️ 🖨️	97.2
5. C#	🌐 📱 🖥️	88.6
6. R	🖥️	88.1
7. JavaScript	🌐 📱	85.5
8. PHP	🌐	81.4
9. Go	🌐 🖥️	76.1

Data Science

Forbes

1. Python

2. Java

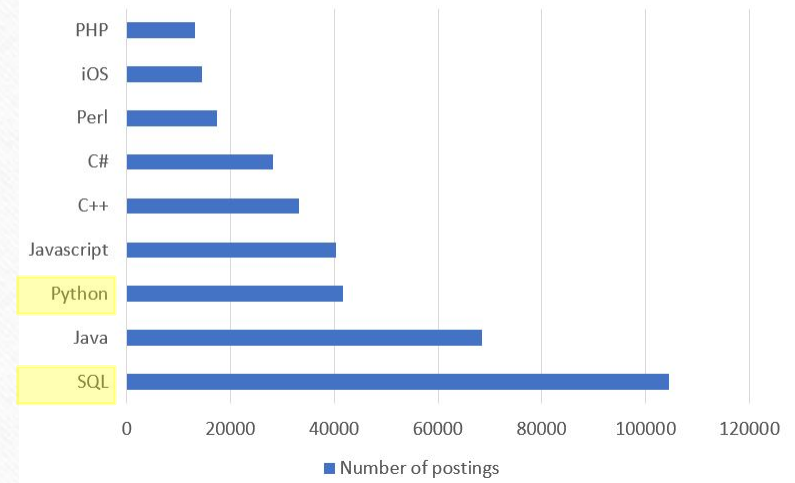
3. JavaScript

4. C#

5. PHP

Indeed.com Job Postings

Number of Indeed Job Postings by Programming Language



Areas Where Agile Hires

- Instrument control software
- LIMS software (increasingly includes Data Science)
- Bioinformatics (i.e. Data Science + Biology/Medicine/Genomics)
- Machine Learning (including Deep Learning AI)
- Validated/Compliant software (ISO/FDA/HIPAA)
- Security

Predictions for 2023

- ~50% of new software applications will be trained AI's
- Several human skill-based professions will be disappearing or gone. We'll all be wondering how it happened so quickly.
- Many computer security systems will be AI-based
- Targeted advertising (based on Data Science) will be frightfully accurate
- Economic/Ethnic/Racial profiling caused by implicit bias in Data Science models will become a societal crisis
- A yearly blood test (powered by DNA sequencing & bioinformatics) will provide early diagnosis of some cancers

**SJSU CS+X Graduates
need to be ready!**