



The University of Texas at Austin  
School of Information

# Machine Learning

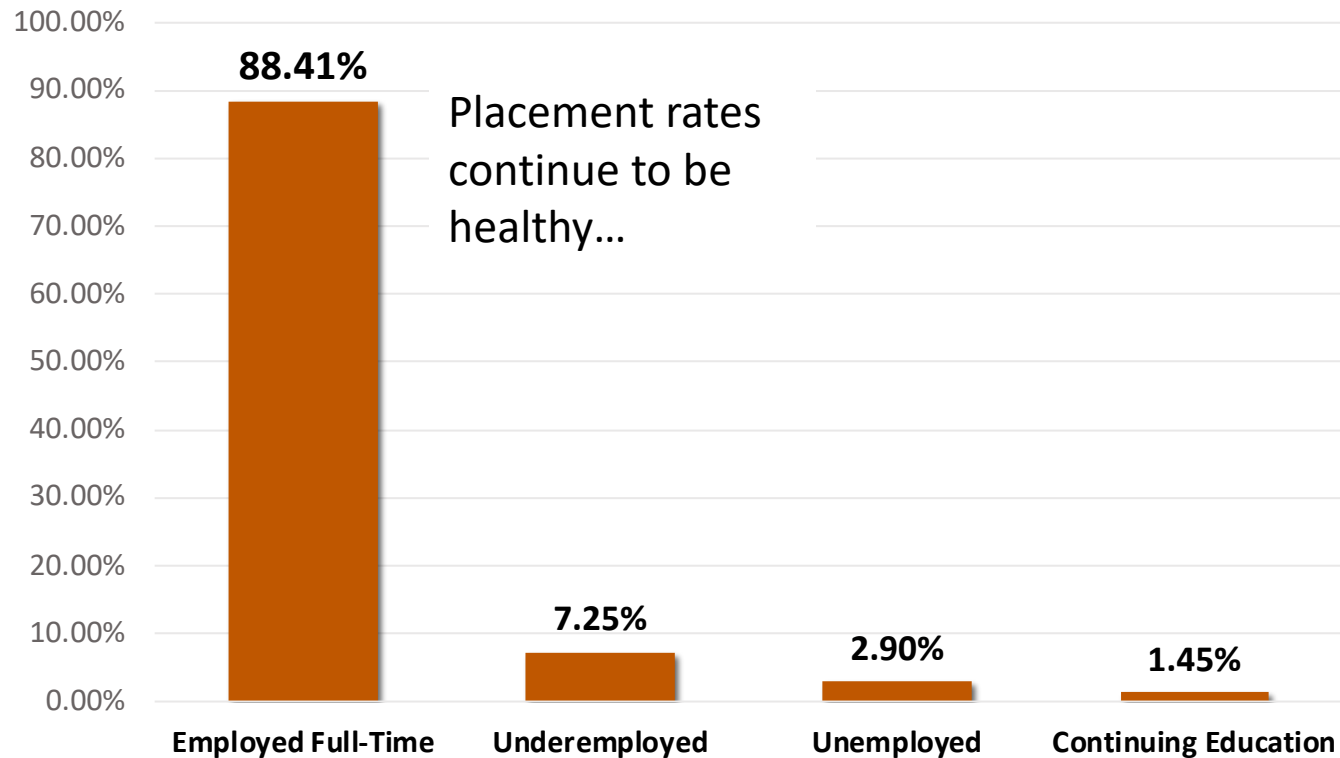
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EMPOWERING YOUR JOB SEARCH

APRIL 25, 2018



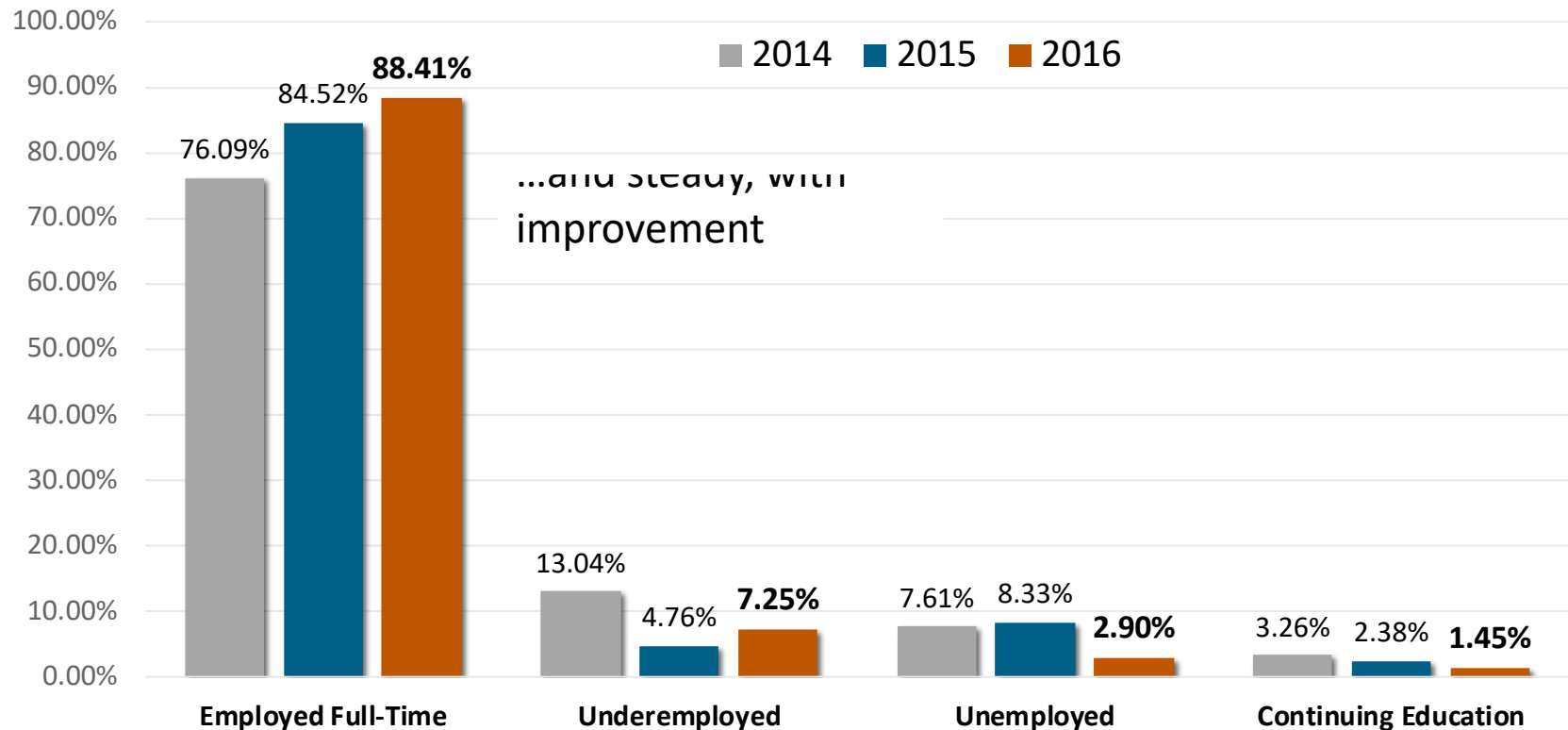
## Class of 2016 Employment Status



Source: Annual placement data reflecting 69 graduates out of 86 in 2016 (80% of class).



# Placement – 3 Years



Source: Annual placement data for iSchool graduates in 2014, 2015, and 2016.



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## Machine Learning Engineer: Job Description & Salary

Machine learning engineers are sophisticated programmers who develop machines and systems that can learn and apply knowledge without specific direction. This article explores the work machine learning engineers do and how to become one.

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### Career Definition of a Machine Learning Engineer

Artificial intelligence is the goal of a machine learning engineer. They are computer programmers, but their focus goes beyond specifically programming machines to perform specific tasks. They create programs that will enable machines to take actions without being specifically directed to perform those tasks. An example of a system a machine learning engineer would work on is a self-driving car.

There are a number of applications for the work that machine learning engineers do. They may program services so that they can try to identify a specific person's interests or needs. From customized news feeds to tailored web searches, machine learning engineers are contributing to the daily lives of many individuals and how they use technology.

<b>Educational Requirements</b>	Master's or doctoral degree
<b>Job Skills</b>	Computer programming skills, strong mathematical skills, knowledge of cloud applications and computer languages, excellent communication skills
<b>Median Salary (2017)*</b>	\$106,225
<b>Job Outlook (2014-2024)**</b>	11% (computer and information research scientists)

Sources: \*PayScale, \*\*U.S. Bureau of Labor Statistics

Key takeaways:

Employment  
projected to grow  
11 percent from  
2014-2024

Median pay =  
\$106,225

Typical entry-level  
education:  
Master's or PhD



# TRAITS AND SKILLS

## NATURAL TRAITS

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Problem-solving

Logic

Attention to detail

Communication

## LEARNED SKILLS

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Computer programming

Mathematical

Computer languages

Cloud apps





***From “The 6 most in-demand AI jobs, and how to get them” in TechRepublic (October 2017):***

AI expected to create 2.3 million jobs by 2030

83% of companies using AI say technology is already adding jobs

Advice from experts:

- Learn from others in the field – meetups and hackathons
- Seek standard business knowledge – translate results of models into operationalized AI systems that impact the bottom line and benefit customers.
- Read up
- Be a sponge and learn, learn, learn



# 5 Skills for ML

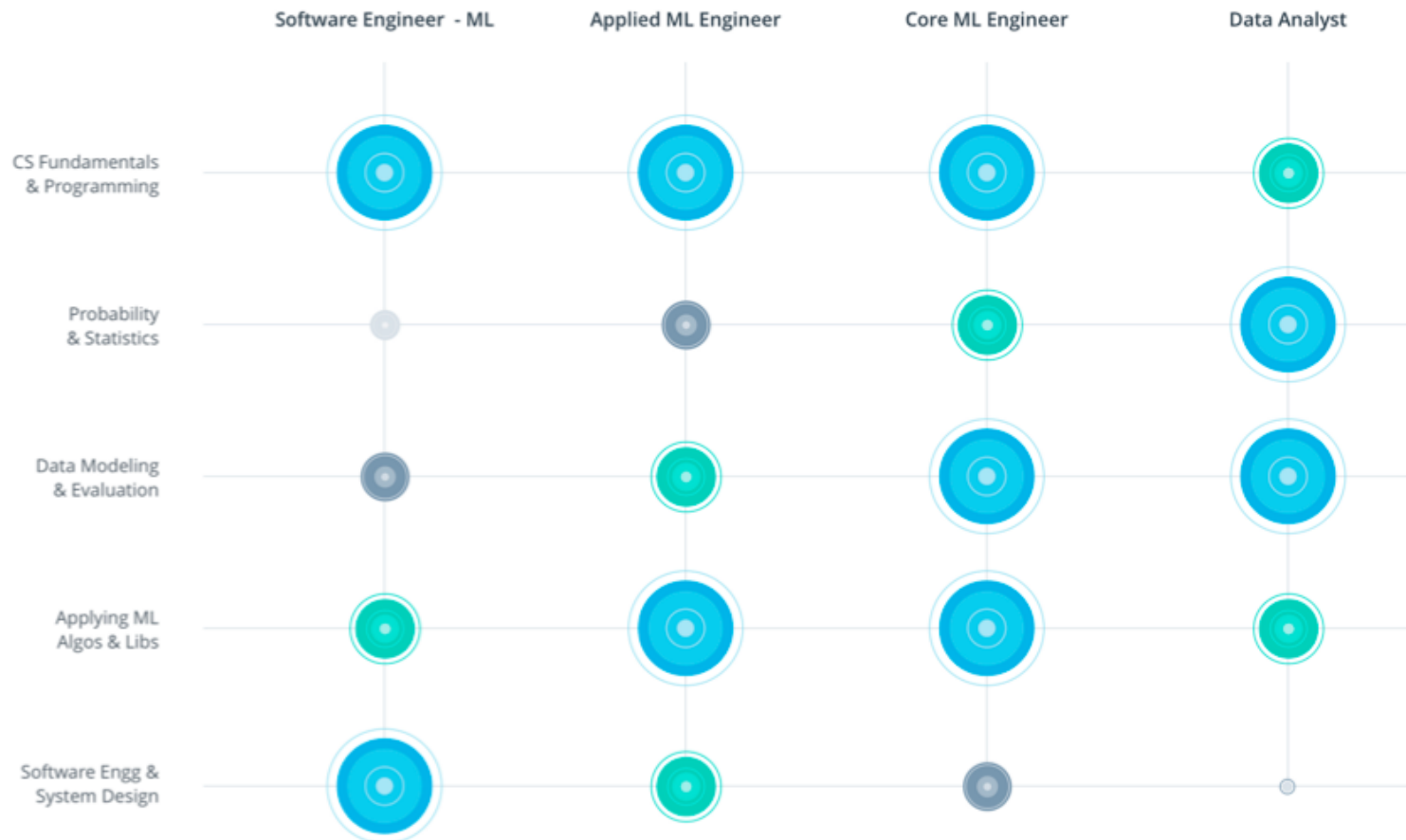
1. CS Fundamentals: Data structures, algorithms, computability, and computer architecture
2. Probability and Statistics
3. Data Modeling and Evaluation (for example, choosing accuracy/error measures)
4. Applying Machine Learning Algorithms and Libraries
5. Software Engineering and System Design (requirements analysis, system design, version control, testing, documentation)

*From <https://blog.udacity.com/2016/04/5-skills-you-need-to-become-a-machine-learning-engineer.html>*





# Machine Learning Job Roles



From <https://blog.udacity.com/2016/04/5-skills-you-need-to-become-a-machine-learning-engineer.html>



# Applying ML Algorithms and Libraries

Involves:

- choosing a suitable model (decision tree, nearest neighbor, neural net, support vector machine, ensemble of multiple models, etc.)
- a learning procedure to fit the data (linear regression, gradient descent, genetic algorithms, bagging, boosting, and other model-specific methods)
- understanding how hyperparameters affect learning

Also need:

- Awareness of the relative advantages and disadvantages of different approaches... and gotchas that can trip you (bias and variance, overfitting and underfitting, missing data, data leakage, etc.)

Advice: Data science and Machine Learning challenges such as those on [Kaggle](https://www.kaggle.com/) are a great way to get exposed to different kinds of problems and their nuances.

*From <https://blog.udacity.com/2016/04/5-skills-you-need-to-become-a-machine-learning-engineer.html>*



# Sample Job Duties

- Train neural networks with TensorFlow on Google Cloud
- Oversee data-labelling on Amazon Turk and other similar platforms
- Own features and functionality from design through deployment
- Design and develop algorithms, models, and pipelines
- Design and develop Predictive Analytics and Prescriptive Analytics architecture and features
- Gather business requirements and technical specifications for developing analytics' solutions
- Development of systems for natural language analysis, classification tasks, information retrieval, machine translation and processing
- Implement, test and improve algorithms
- Perform data collection, preprocessing, feature engineering, data visualization and analysis
- Build automation of data collection and preprocessing
- Build models to address business problems
- Engage with lines of business, users and analysts to explore and prototype opportunities and use-cases exploiting data and the application of cognitive and machine learning technologies



# Job Posting Samples

## Remote Machine Learning Engineer



CyberCoders  
Austin, TX

Apply

Monster

ZipRecruiter

🕒 4 days ago

💰 \$ 140K–250K a year

💼 Full-time

Requirements: • Industry or academic project experience with neural network development. • Fluent in at least **C++**, **Java** and **Python** . • Experience architecting and implementing reliable, performant, high-scale machine learning operations on **AWS** or **Google Cloud**. • Strong knowledge of Robot Operating System, and Unix-based operating systems.

If you are a Remote Machine Learning Engineer with experience, please read on!

Top Reasons to Work with Us

We are looking for a brilliant Machine Learning Engineer with experience to bring a mix of true grit and solid craftsmanship to our growing team. Day-to-day you will work with other world-class engineers to design, code, test, and deploy amazing features that allow boats and ships to self-navigate. We are a product-driven company, and every line of code you contribute will help move our vision forward.



# Job Posting Samples

## Machine Learning Engineer



TrendKite  
Austin, TX

Apply

Lever

LinkedIn

Glassdoor

 Full-time

Requirements: • Practical experience at large scale in one or more of the following domains: natural language processing, machine learning, search, information retrieval or text classification • Solid experience in **Java, Python, Scala**, or another object-oriented language • Familiarity with ML/NLP frameworks such as **scikit-learn, Weka, Pandas, Mallet, TensorFlow, PyTorch, Theano**

What we do: TrendKite is transforming the way the world views earned media - and we're making life better for PR professionals in the process. Our platform harnesses big data and analytics to easily measure the impact news coverage has on a brand's reputation, website traffic, and business goals. As a venture backed, high traction startup, we're disrupting a huge existing market while helping companies like Nike, Google, Delta, SXSW and hundreds more turn PR coverage into real business impact.



# Job Posting Samples

## Machine Learning Engineer



BeaconHome  
Austin, TX

Apply

[LinkedIn](#)

🕒 Over 1 month ago

💼 Full-time

Career Opportunity

Requirements: • Master's or PhD Degree in Electrical Engineering, Computer Science, Statistics or equivalent technical field from an accredited institution. • Software development skills in one or more high level languages (**C#/C/C++/Java/Python**) and rapid prototyping platform (MATLAB/SIMULINK). • Expertise with common machine learning tools (**Weka, R, RapidMiner** and etc.) and experience with **AWS or Azure** is a plus. • Demonstrated history of developing frameworks that are effectively leveraged by other developers \* Demonstrated history of assessing and adopting new analytics platforms and techniques (**TensorFlow, Python, Lambda, PMML**, etc)

When a dedicated team focuses on a mission, amazing things can be accomplished. We want you to bring your focus to our mission; enabling our homes to be more aware of us so the systems inside of them can be proactive in meeting human needs.

As the leader of our Human Focused Intelligent Recognition Systems Team (FIRST), you'll apply your career knowledge to converting a mountain of sensor data into meaningful insights about how occupants are using the spaces they live in, and in turn, enabling our products to improve their lives every day. This problem and its amazing challenges are the reason you are the perfect person to define, build, and lead our team to industry recognized success. The opportunity to make "first" happen in, deep learning and real-time recognition algorithms recognizing occupant behavior by applying the latest in signal processing is the next logical step in your career. Whether you're already working on machine perception



# Job Posting Samples

## Machine Learning Engineer - (8028)



FactSet  
Austin, TX

Apply

[Lensa.com](#)

🕒 Over 1 month ago

👤 Full-time

Department: Content Integration Engineering

FactSet is currently seeking a talented and motivated professional to join the Machine Learning and Language Technologies(MLT) Group. The primary responsibility for this position will be the development of systems for natural language analysis, classification tasks, information retrieval, machine translation and processing of financial data.

Required: **MS**, or PhD in Computer Science or related discipline. Strong proficiency in **Java or Python**. Familiarity with Open Source ML/NLP toolkits (We like tools such as **scikit-learn, Mallet, IPython, Pandas, Weka, Vowpal Wabbit**). Strong verbal and written communication skills



# Job Posting Samples

## Product Science Manager



Indeed  
Austin, TX

Apply

[Work At Indeed](#)

[Glassdoor](#)



Ref#: P1223

Our mission.

As the world's number 1 job site, our mission is to help people get jobs. We need talented, passionate people working together to make this happen. We are looking to grow our teams with people who share our energy and enthusiasm for creating the best experience for job seekers.

We get excited about candidates who can •  
Program in **R, Python, and/or Java** • Fish for data  
using SQL and/or Pandas • Communicate  
concisely and persuasively with engineers and  
product managers





## Entry Level - Data Scientist and Cognitive Engineer - Austin



State Street  
Austin, TX

Apply

[Myworkdayjobs.com](#)

[Glassdoor](#)

[Lensa.com](#)

Full-time

Highly preferred skills: Modern, object-oriented or functional programming experience, (**Java, C++, Python, Scala, SQL, R**) • Data Science and Machine Learning Frameworks (**“R”, Apache Spark / MLlib, TensorFlow, Scikit-learn**) • Natural Language Processing (NLTK, CoreNLP, Gensim, Spacy) • Experience with Big-Data technologies and cloud (**AWS**, other)

As part of State Street’s continued investment in technological transformation, we are seeking expertise in the field of Cloud Platform Development, Robotics Process Automation and Cognitive development. Any financial background is certainly a plus in our business, but not required.



## Machine Learning and Predictive Algorithms Designer / Co-Founder



Predictive Elephant  
Austin, TX

Apply

[AngelList](#)

🕒 Over 1 month ago

💼 Full-time

Required:

- BA or BS degree required (MS preferred) in Computer Science, Applied Mathematics, Statistics, Electrical Engineering or a related technical field
- Solid background in computer science or applied mathematics and statistics.
- One year of experience analyzing large, complex, multi-dimensional data sets and developing analytic solutions and having experience in predictive analytics using **R, Python, Scikit-learn, SQL** or similar statistical tools.
- Proficiency in at least one object oriented programming language, **Java**
- Excellent problem solving skills, with attention to detail and focus on quality; solid understanding of algorithms and databases.
- Very good verbal and written communications skills

Predictive Elephant is a United States based Big Data Science solution and services company that augments automated real-time data analysis for decision making under uncertainty.



## **Entry Level Data Scientist and Cognitive Engineer:**

- Modern, object-oriented or functional programming experience, (Java, C++, Python, Scala, SQL, R)
- Data Science and Machine Learning Frameworks (“R”, Apache Spark / MLlib, TensorFlow, Scikit-learn, etc...)
- Natural Language Processing (NLTK, CoreNLP, Gensim, Spacy, etc..)
- Experience with Big-Data technologies and cloud (AWS, other)
- Linux / Bash scripting
- Relational databases (Oracle, PostgreSQL, MySQL, etc.)
- Agile development methodology
- CI/CD Development environments and tools (GIT, Maven, Jenkins, etc)
- RESTful Microservice APIs • Strong analytical skills.



- Clean, crisp, and focused **resume**:
  - Add coursework under Projects
  - Be sure there is a Skills section
- Use every **job search tool** available to you:
  - Indeed, LinkedIn, Glassdoor, iCareers
  - Industry-specific sites
  - Specific companies
- Be **open-minded** and creative with job titles:
  - Explore and learn
  - Read job postings!
- Connect and **network**:
  - Talk to professionals
  - Do informational interviews