Machine Learning is getting computers to program themselves. If programming is automation, then machine learning is automating the process of automation.

Writing software is the bottleneck, we don’t have enough good developers. Let the data do the work instead of people. Machine learning is the way to make programming scalable.

* **Traditional Programming**: Data and program is run on the computer to produce the output.
* **Machine Learning**: Data and output is run on the computer to create a program. This program can be used in traditional programming.

Machine learning is like farming or gardening. Seeds is the algorithms, nutrients is the data, the gardner is you and plants is the programs.

**Applications of Machine Learning**

Sample applications of machine learning:

* **Web search**: ranking page based on what you are most likely to click on.
* **Computational** biology: rational design drugs in the computer based on past experiments.
* **Finance**: decide who to send what credit card offers to. Evaluation of risk on credit offers. How to decide where to invest money.
* **E-commerce**:  Predicting customer churn. Whether or not a transaction is fraudulent.
* **Space exploration**: space probes and radio astronomy.
* **Robotics**: how to handle uncertainty in new environments. Autonomous. Self-driving car.
* **Information extraction**: Ask questions over databases across the web.
* **Social networks**: Data on relationships and preferences. Machine learning to extract value from data.
* **Debugging**: Use in computer science problems like debugging. Labor intensive process. Could suggest where the bug could be.