

# *The AI Conference 2017*

*The AI Conference took place in San Francisco on September 19th and 20th. The conference was hosted by O'Reilly Media*

## Rana el Kaliouby (Affectiva)

- Emotion sensing is highly complex. Facial expressions and tone is so huge in determining humans' current state.
- Analyzing emotion is important in
  - Determining whether driver is awake or aware of surroundings.
  - Personalized suggestions from your fridge
  - Learning app personalized experience based on user's emotional engagement.
  - Social robots
    - In healthcare
    - In education

## Ruchir Puri (IBM)

- Enterprises have a lot of data, but the question is how much of that data is labeled?
  - Need to figure out how to learn from small data. Need to figure out how to not just rely on a shit ton of labeled examples.
- Labeling data has concerns with domain expertise and privacy of those labels.
- Enterprises deal a lot with pictures, graphs, tables, etc in scanned PDF documents. Right now, we don't have AI that can really interpret and extract knowledge from those sources.

## Vijay Pande (Andreessen Horowitz)

- Compute and storage have become exponentially cheaper over the last decade.
- As compute and storage has become cheap, so has data collection
  - Cost of sensors has decreased drastically
- The decrease in the cost of genome sequencing has been absolutely incredible
  - About 1000 dollars or less now
- When thinking about ways to cure disease and cancer, the key in a lot of cases is early detection.
- Curiously, drug prices are exponentially increasing.
  - But a question is if a drug is the answer to every disease.
  - There are a lot of behavioral therapies.

- ML is ushering a new era of prevention.

### Andrew Ng (Coursera)

- “AI is the new electricity”
- Honestly the same as his ML Nuts and Bolts talk (search it up on YouTube)
- An interesting analogy that Andrew made
  - In the Internet era, Shopping mall + Website != Internet company
  - In the AI era, traditional tech company + ML != AI company
- **Real AI companies tend to be really good at strategic data acquisition, have centralized data warehouses, and pervasive automation.**

### Jeremy Stanley (Instacart)

- Shopper speed increases with the number of items they are picking.
- DL solution predicts the route that the fastest shopper will follow.

### Michael Jordan (UC Berkeley)

- Bad local minima used to be thought of as the main problem with optimization.
  - But honestly SGD works anyway
- Saddle points are the real problem and cause the learning curve to flatten out.
  - Having a Hessian matrix would solve the problem, but computing that is expensive af
- In convex problems, gradient descent will always converge to the global minimum with any number of dimensions.
- Perturbed gradient descent escapes saddle points efficiently without second order information.
- It's not just traditional optimization theory that we need to work on, but also understanding the effect of geometry in those high dimensions.

### Jia Li (Google Cloud)

- It's all about democratizing compute, data, algorithms, and talent.

### Tim O'Reilly (O'Reilly Media)

- The runaway objective is the main reason for the worry of dangerous AI
  - There are unintended consequences
  - A rogue trading algo that determines that triggering a war is the best way to optimize profits.

- We shouldn't worry about if AI will turn sentient, we should worry more what people in power will do with AI

### Alexei Efros (UC Berkeley)

- "Life is good in Deepland". All you need is
  - Label training data
  - Define objective function
  - Train NN
- Well, those first two steps are nontrivial.
  - Labels are expensive
  - Objective functions are hard to design
    - King Midas problem where he wanted to be rich and made everything he touch turn to gold. Turns out that's not exactly the best objective.
- Self supervision is where data is its own supervision.
- Be aware for when you are designing your objective/loss function and look for unintended averaging effects.
- You can hack together a complex af loss function, but don't think that's sustainable.

### Interesting Companies

- Affectiva
- Jibo
- Pipeline AI
- Appzen
- Cardiogram
- Freenome
- Omada Health
- Crowdfunder
- SigOpt