Machine Learning: Bridge from Education to Career

Michael Soltys
March 3, 2022 @ AWS MLU





University of Toronto



Geoffrey Hinton was pioneering deep learning (1990-2015)

"All the News That's Fit to Print."

The New York Times.

THE WEATHER.

Rain to-day; fair to-morrow,

VOL. LIII...NO. 16,774.

NEW YORK, FRIDAY, OCTOBER 9, 1903.-FOURTEEN PAGES

ONE CENT Jerrey Str and Bernark, Two CENT

Report That Ninety Warships Have Arrived at Masam-Pho.

Yesterday Part of Manchuria Should of The Tires, that the Manchurian in-

PARES Oct. 6.—Official followanties: "
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concerning an ext. Pert Archae one has
the methods is Marchael.

Spring to See If the Reforms Are Carried Out.

Epond Calegran.

and Light Company.

MAY SUSPEND BALKAN REVOLT. TO EXTRADITE GRAFTERS \$150,000,000 MORTGAGE FILED.

Treaties Covering Bribery to be Negotiated at Once.

ders Work Begun-The Treaties

Siven by Levige Valley Railroad to th

Grand Trust Company for In-

MARRIED ON STOLEN MONEY.

a Rend de Las Girl.

Statement of Connection With Shipbuilding Trust.

M'LAUGHLIN DECLARES WAR ON M'CARREN

James Shevin Calls the Senator a Political Acrobat.

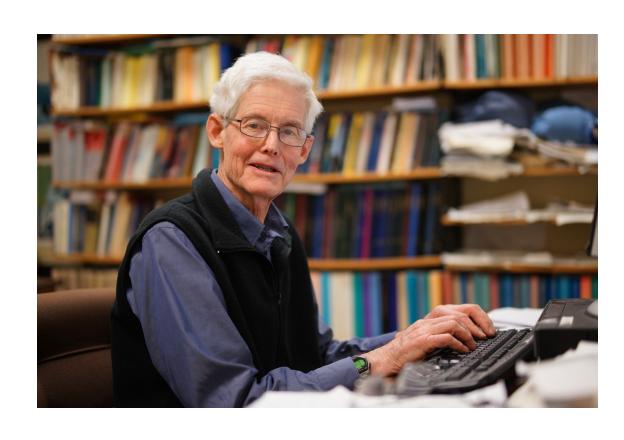
EFFECT OF LITTLETON SPEECH

Personness Districts Counted as Against Willoughby Street.

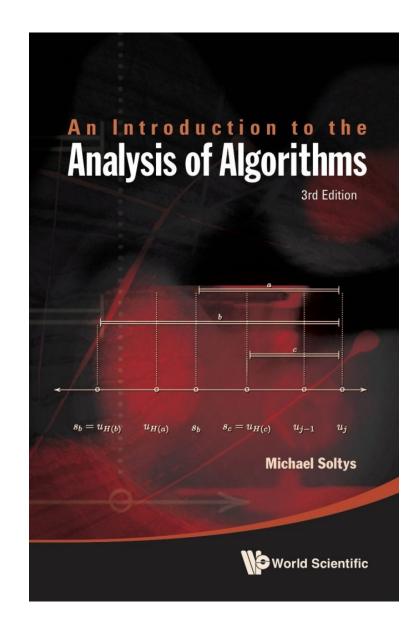
1903 NYT weeks before Wright brothers flew for first time:

man will not fly for 10 million years

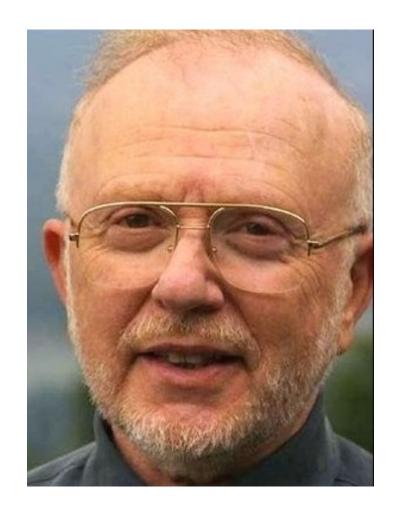
Stephen Cook



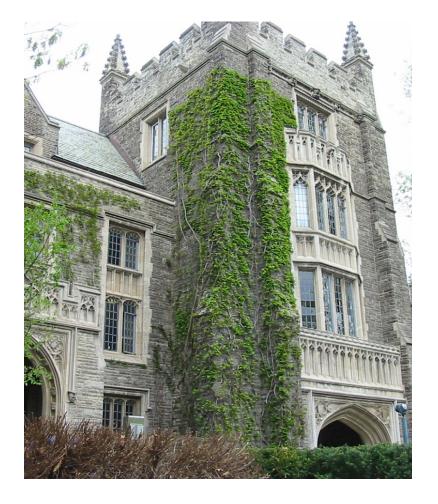




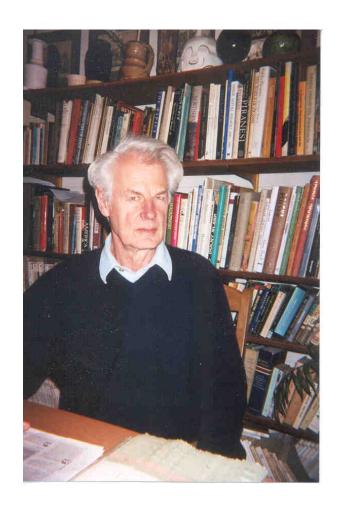
McMaster University

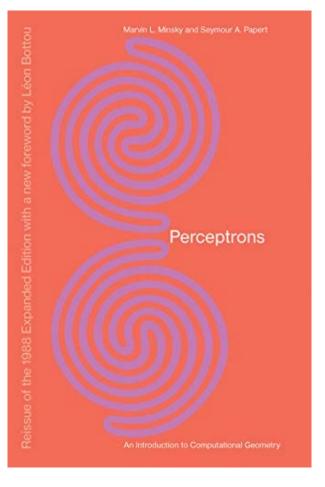


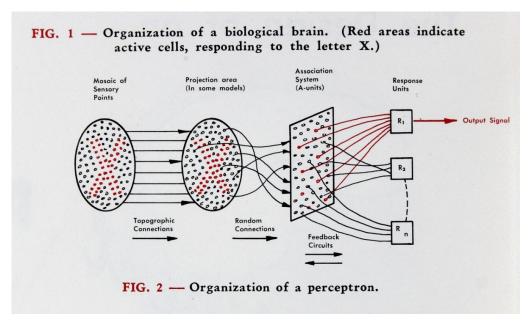
Copy and paste is a design error.
-David Parnas



Jan Mycielski





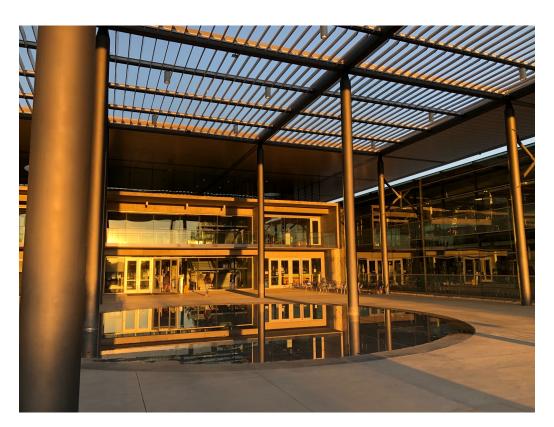


Perceptrons: an intro to computational geometry by Marvin Minsky and Seymour Papert, 1969. An edition with handwritten corrections released in the early 1970s.

California State Univ, Channel Islands campus



7K students 60% Hispanic, 65% first generation



In Santa Monica Mountains
Close to the beach

GBL Systems Corporation





Who are our students?

- Working jobs, with family obligations
- Family takes the burden of education, expects ROI
- 1st generation to go to college
- "Participation" has a different meaning (e.g., Discord)
- Learn through activity
- Cannot assume any background
- Material judged as "useful" or not
- Lonely (see https://www.quantamagazine.org/how-loneliness-reshapes-the-brain-20230228)



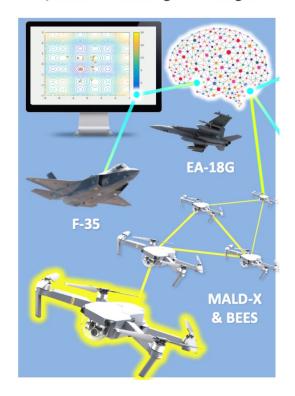
So how do we teach ML to our students?

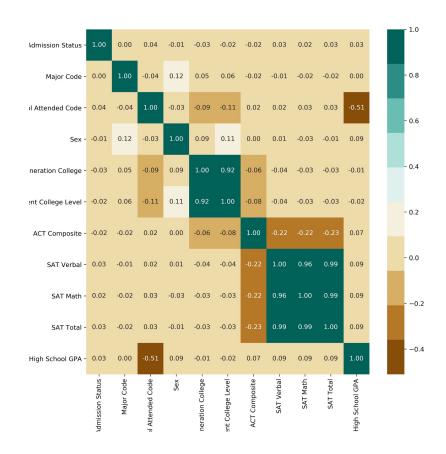
- To motivate:
 - Use notoriety of the field (e.g., ChatGPT)
 - Career opportunities: 40% market growth, 40% job automated by 2030s, LinkedIn listing .5M jobs worldwide in ML, etc.
- Visualizations: https://t.co/bXJNGUHkdw
- Start the process early because many threads are woven into ML:
 - Python (freshmen)
 - Jupyter Notebooks (sophomore) [prototype not deployment]
 - Algebra and Calculus (freshmen and sophomore)
- Emphasize doing ML and not understanding theory of ML

Example of work



AI/Machine Learning Technologies





https://github.com/michaelsoltys/sagemaker-enrollment

Important but not intellectually "elegant"

- CI/CD aspect of ML
 - In industry Git is one of the most important tools
 - Understanding the mathematical foundations is probably the least important
- Documentation has to be superb, and it seldom is
- It doesn't work for a long time ..., until it finally works a little bit
- Interpretation of data what does 0.3 likelihood of coming to CI mean?
- Communications of methodology and findings super important! Listen to customer, do not push your fav technology; what is business need?
- Politics of data:
 - No one wants to share their data, even within the same organization; negotiating for data and terms of usage (e.g., access) takes 50% of time of entire effort
 - Hard to reach agreement on "goodness" of data
 - Even harder to reach agreement on "conclusion" and how to craft policy based on the data

SUPER-PWERS CHINA, SILICON VALLEY, NEW WORLD ORDER KAI-FU LEE

Weakness of organized knowledge: stovepipes

