

Deep thinking in AI

Traditions, future, fairness and ethics

Programming goes back to the 1820s.

It's been a field that has been around for a while.

Programming is about telling the computer how to play chess.

How do we do better than that?

How do we make a computer beat a champion at chess?

How do we make the computer solve problems we don't know the solution to?



This is our first foray into intelligence.

Making calculated decisions based on previously observed data.

One paradigm through which this is achieved is called machine learning.

Mitchell (1997) says: “A computer program is said to learn from experience E with respect to some class of tasks T and performance measure P , if its performance at tasks in T , as measured by P , improves with experience E .”



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NEWS

Jun 17, 2009

Predicting Query to Ad Relevance

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Friday, August 27, 1999

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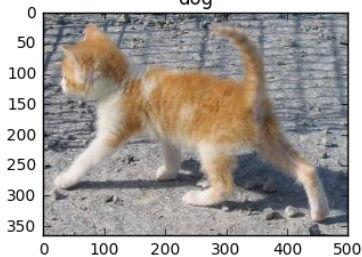
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But what about complex problems that we don't know about like medical drug discovery or diagnosis of diseases?

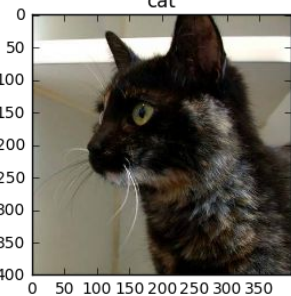
Merck Molecular Activity Challenge

<http://blog.kaggle.com/2012/11/01/deep-learning-how-i-did-it-merck-1st-place-interview/>

dog



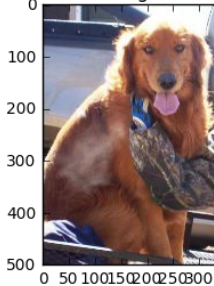
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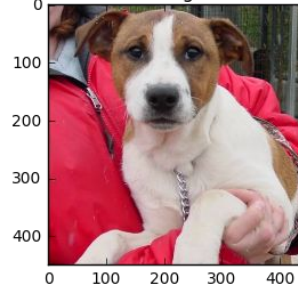
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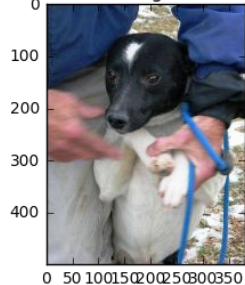
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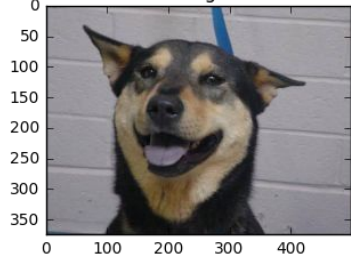
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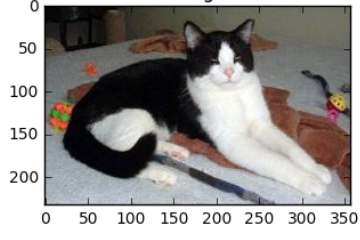
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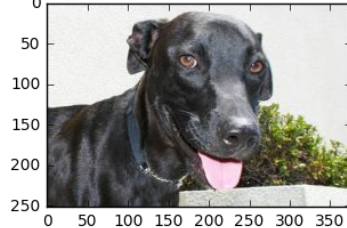
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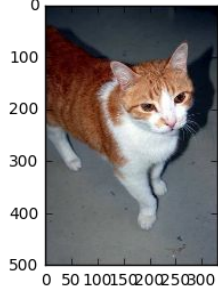
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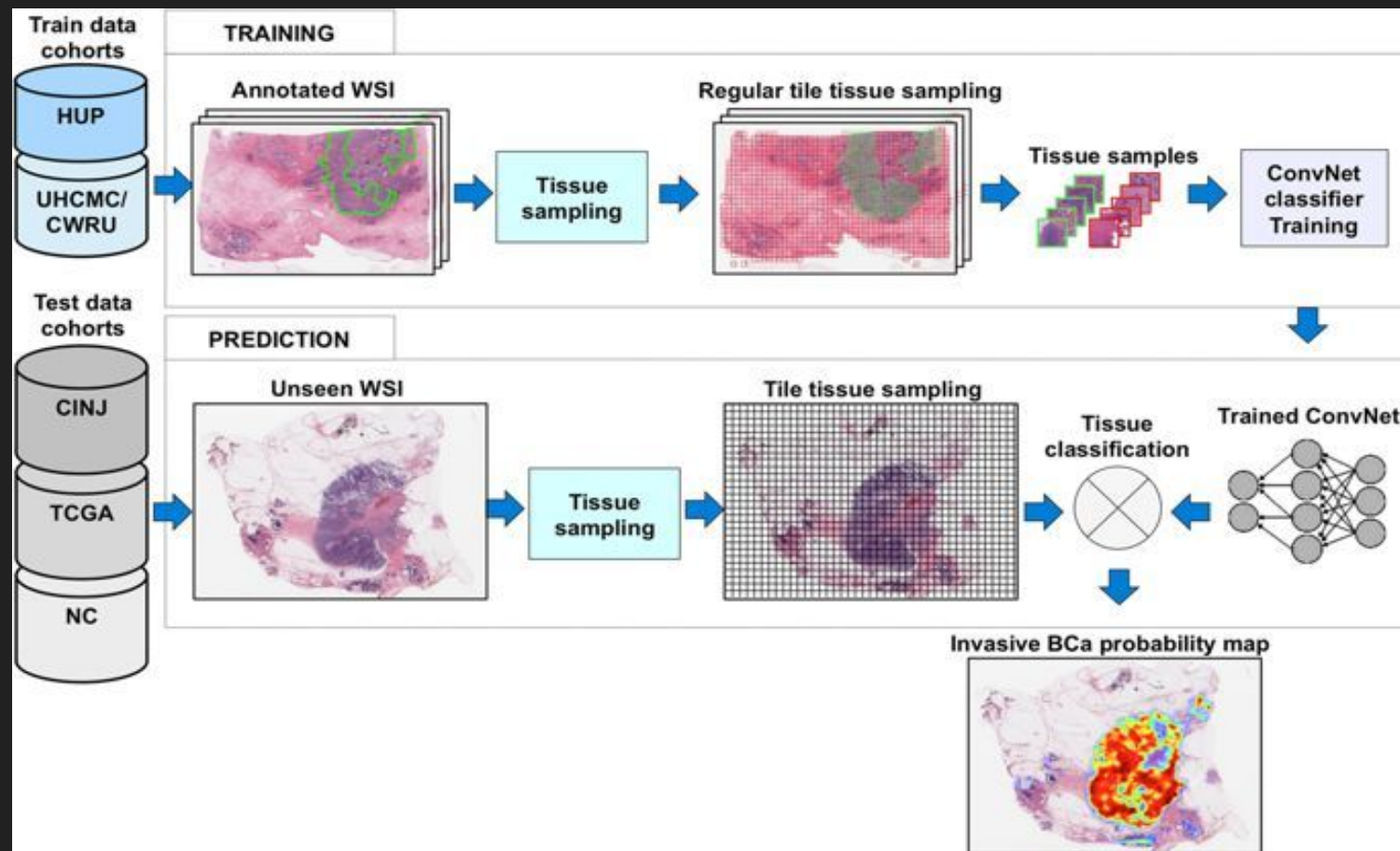
<https://rowhanm.github.io/MiniCatsDogs/>

It can listen and understand as well -



It can perform better than humans as well at certain tasks

TEAM	METHOD	TOTAL	SUBSET
			All signs ▼
[156] DeepKnowledge Seville	CNN with 3 Spatial Transformers	99.71%	99.71%
[3] IDSIA ★	Committee of CNNs	99.46%	99.46%
[155] COSFIRE	Color-blob-based COSFIRE filters for object recogn	98.97%	98.97%
[1] INI-RTCV ★	Human Performance	98.84%	98.84%
[4] sermanet ★	Multi-Scale CNNs	98.31%	98.31%
[2] CAOR ★	Random Forests	96.14%	96.14%
[6] INI-RTCV	LDA on HOG 2	95.68%	95.68%
[5] INI-RTCV	LDA on HOG 1	93.18%	93.18%
[7] INI-RTCV	LDA on HOG 3	92.34%	92.34%



What can happen in the future

<https://medium.com/@eirinimalliaraki/toward-ethical-transparent-and-fair-ai-ml-a-critical-reading-list-d950e70a70ea>

ROBO RECRUITING

Can an Algorithm Hire Better Than a Human?



Claire Cain Miller @clairecm JUNE 25, 2015



Hiring and recruiting might seem like some of the least likely jobs to be automated. The whole process seems to need human skills that computers lack, like making conversation and reading social cues.

But people have biases and predilections. They make hiring decisions, often unconsciously, based on similarities that have nothing to do with the job requirements — like whether an applicant has a friend in common, went to the same school or likes the same sports.

That is one reason researchers say traditional job searches are broken. The question is how to make them better.

A new wave of start-ups — including [Gild](#), [Entelo](#), [Textio](#), [Doxa](#) and [GapJumpers](#) — is trying various ways to automate hiring. They say that software can do the job more effectively and efficiently than people can. Many people are beginning to buy into the idea. Established headhunting firms like Korn Ferry are [incorporating algorithms](#) into their work, too.

If they succeed, they say, hiring could become faster and less expensive, and their data could lead recruiters to more highly skilled people who are better matches for their companies. Another potential result: a more diverse workplace. The software relies on data to surface candidates from a wide variety of places and match their skills to the job requirements, free of human biases.

“Every company vets its own way, by schools or companies on résumés,” said Sheeroy Desai, co-founder and chief executive of Gild, which makes software for the entire hiring process. “It can be predictive, but the problem is it is biased. They’re dismissing tons and tons of qualified people.”

RECENT COMMENTS

Mayurakshi Ghosh January 7, 2016

Hi Claire, excellent article and really insightful facts on algorithm recruitment. I completely agree how you mentioned the role played by...

Deborah Bishop July 2, 2015

This is a very interesting article. Perhaps distinguishing between different aspects in the process of bringing talent into your...

Yeti July 2, 2015

Including talents that would be rejected by the subjective biased boss or colleagues does not guarantee their integration. They will be...

[SEE ALL COMMENTS](#) [WRITE A COMMENT](#)

Non-discrimination, equality of opportunity, and equality of outcome

The incidence and persistence of discrimination
Callback rate 50% higher for applicants with white names
than equally qualified applicants with black names
Bertrand, Mullainathan (2004)

Can this human bias be removed using ML?

Not yet, unfortunately

How machines learn to discriminate

- Skewed sample

- Tainted examples

- Limited features

- Sample size disparity

- Proxies

B, Selbst (2016)

Fairness in Machine Learning

NIPS 2017 Tutorial – Part I

Solon Barocas and Moritz Hardt



Cornell University

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In conclusion

All kinds of datasets are available for free for anyone.

Students can actively participate in competitions and compete with the industry and academia and achieve state of the art results.

But, instead of just jumping towards higher accuracy values, be conscious about fairness, bias and ethics.