PRISM

Lecture 1 - An Overview of CS Research

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University of Toronto, Winter 2021

This Workshop

- Topics
  - **Week 1 (today):** CS Research overview
  - **Week 2:** Learning about prior work
  - **Week 3:** Scientific problem solving
  - **Week 4:** Writing a research paper
  - **Week 5:** Giving talks and presenting posters
  - **Week 6:** Embarking on your research career
- This plan is flexible, so if there's another topics you'd like to hear about, just let us know!

This Workshop

- **Typical class meeting**
  - 40 minute talk by a CS researcher
  - 40 minutes of lecture
  - 30 minute interactive activity (e.g. critique a paper or talk)
- **Today:** research talks by faculty members
- **Final week:** Poster session, presentation of lit reviews

This Workshop

- Not a course, so no formal enrollment or certificate of completion
- Won't help your CV — participate because you want to learn, not because it will give you a leg up
- What's required?
  - Participate in in-class activities
  - Present a lit review in the poster session on the final day (4/9), on a research topic of your choosing

The Research Experience

How is research different from courses?

- Rather than absorbing existing knowledge, trying to produce new knowledge
- Learn one topic very deeply
- No single right answer, no clear-cut boundary between success and failure
- Learn things as you need them, rather than proceeding linearly through subjects
- Many different things can go wrong and ruin an experiment
- Exciting to be at the frontier of knowledge

The Research Experience

Some challenges

- Dealing with repeated failure
  - Most attempts don't succeed — which is why the problem hasn't been solved yet!
  - Important not to take it personally
- Uncertainty: you don't know how the results will turn out, which is why we need to do science
- Isolation: very few people understand the details of the work that you're doing

The Research Experience

The ups-and-downs of research

- "This problem is impossible."
- "Wait — I got it!"
- "Oh, doesn't work. I forgot about X."
- "Hey, I fixed it! Now it works waaaay better than the baseline."
- "Darn, I found a bug in my baseline implementation. Now the baseline's just as good."
- "Oooh, there it is. I set $\alpha = 0.1$, but setting $\alpha = 0.5$ works waaay better."
- "Oh no! Here's a paper in last year's conference that did the same thing!"
- "Actually, now that I read it again, it's totally not the same thing. My way is better because of X, Y, and Z."
- And so on...

The Diversity of CS Research

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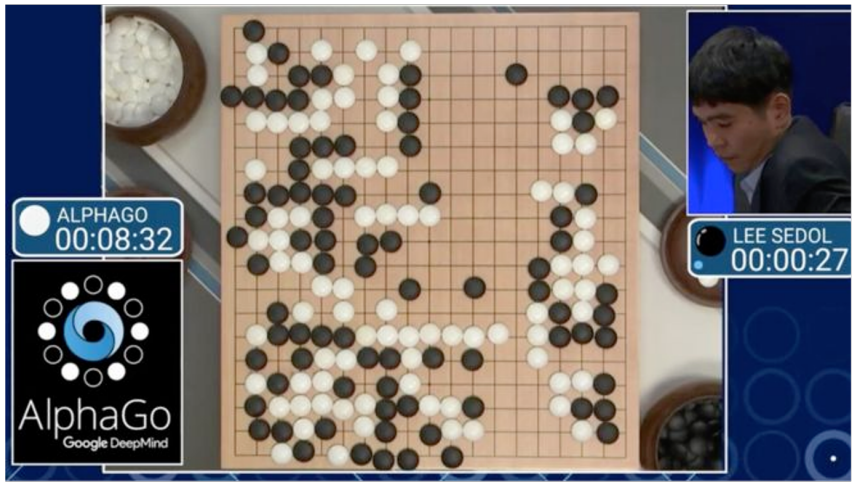

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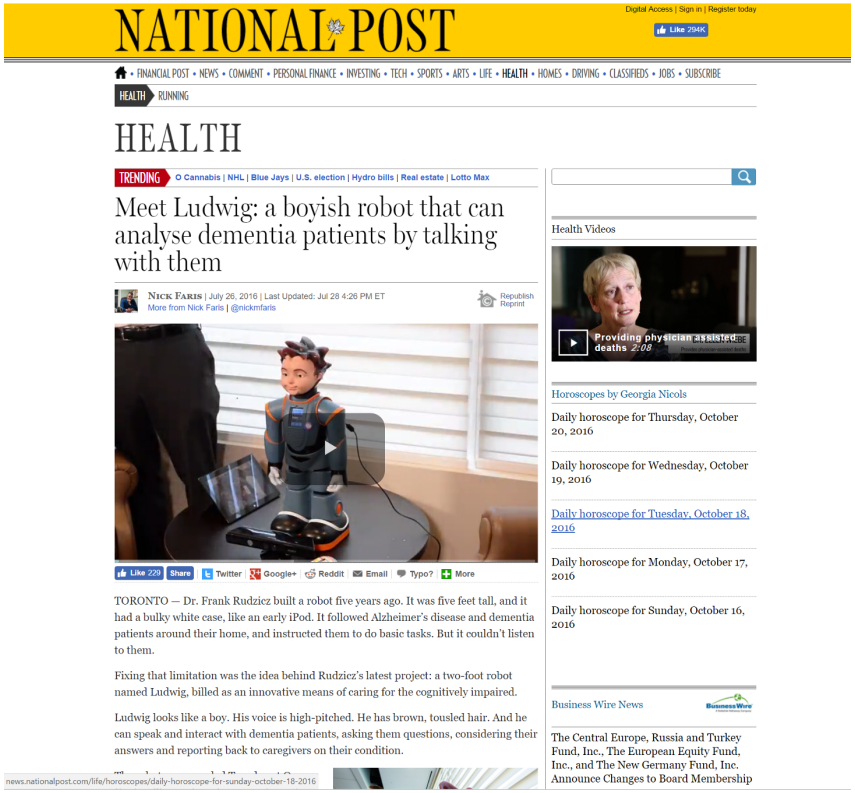

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Meet Ludwig: a boyish robot that can analyse dementia patients by talking with them

NICK FARIS | July 26, 2016 | Last Updated: Jul 28 4:26 PM ET

More from Nick Faris | @nickmfaris

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TORONTO — Dr. Frank Rudzicz built a robot five years ago. It was five feet tall, and it had a bulky white case, like an early iPod. It followed Alzheimer's disease and dementia patients around their home, and instructed them to do basic tasks. But it couldn't listen to them.

Fixing that limitation was the idea behind Rudzicz's latest project: a two-foot robot named Ludwig, billed as an innovative means of caring for the cognitively impaired.

Ludwig looks like a boy. His voice is high-pitched. He has brown, tousled hair. And he can speak and interact with dementia patients, asking them questions, considering their answers and reporting back to caregivers on their condition.

Health Videos

Providing physician assisted deaths 2:08

Horoscopes by Georgia Nicols

Daily horoscope for Thursday, October 20, 2016

Daily horoscope for Wednesday, October 19, 2016

Daily horoscope for Tuesday, October 18, 2016

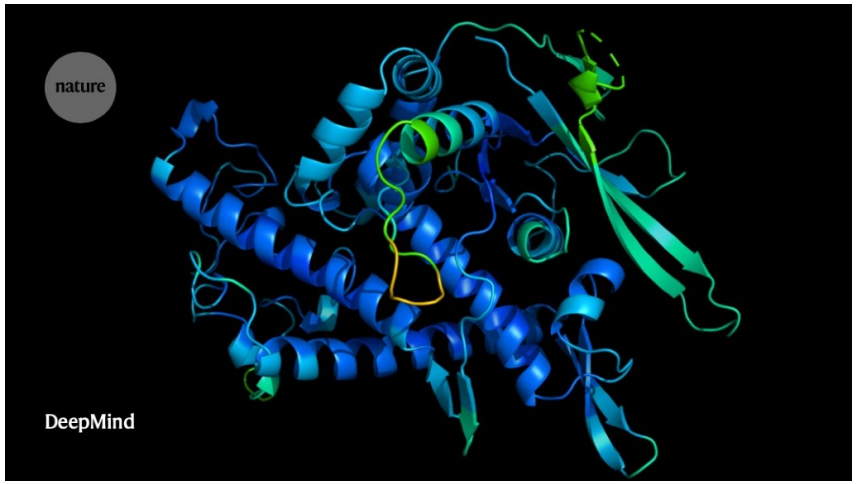
Daily horoscope for Monday, October 17, 2016

Daily horoscope for Sunday, October 16, 2016

Business Wire News

The Central Europe, Russia and Turkey Fund, Inc., The European Equity Fund, Inc., and The New Germany Fund, Inc. Announce Changes to Board Membership

news.nationalpost.com/life/horoscopes/daily-horoscope-for-sunday-october-18-2016



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