



DeepRob

Discussion 3

How to Read Deep Learning Research Papers

University of Michigan and University of Minnesota



Science Robotics



Today's Agenda

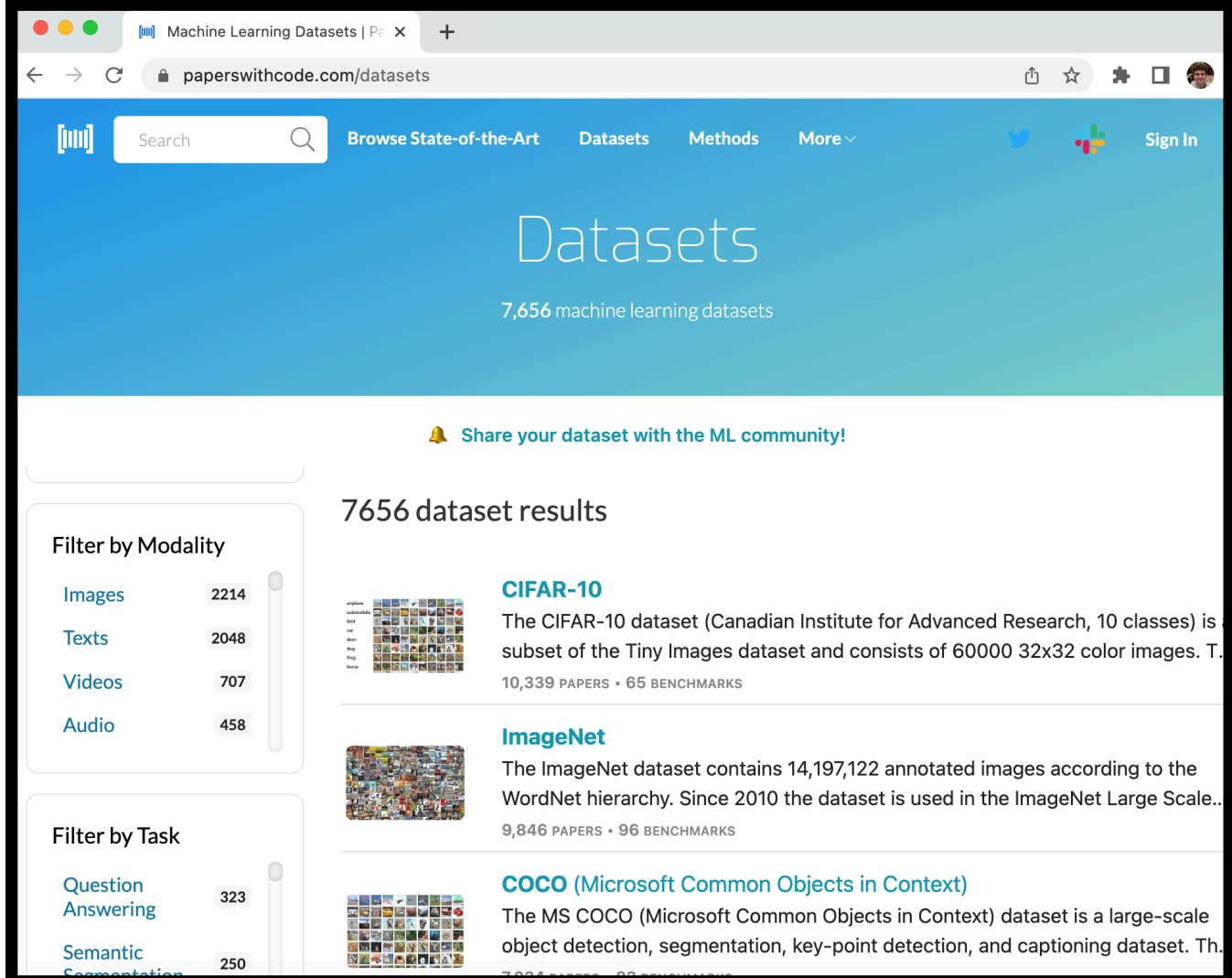
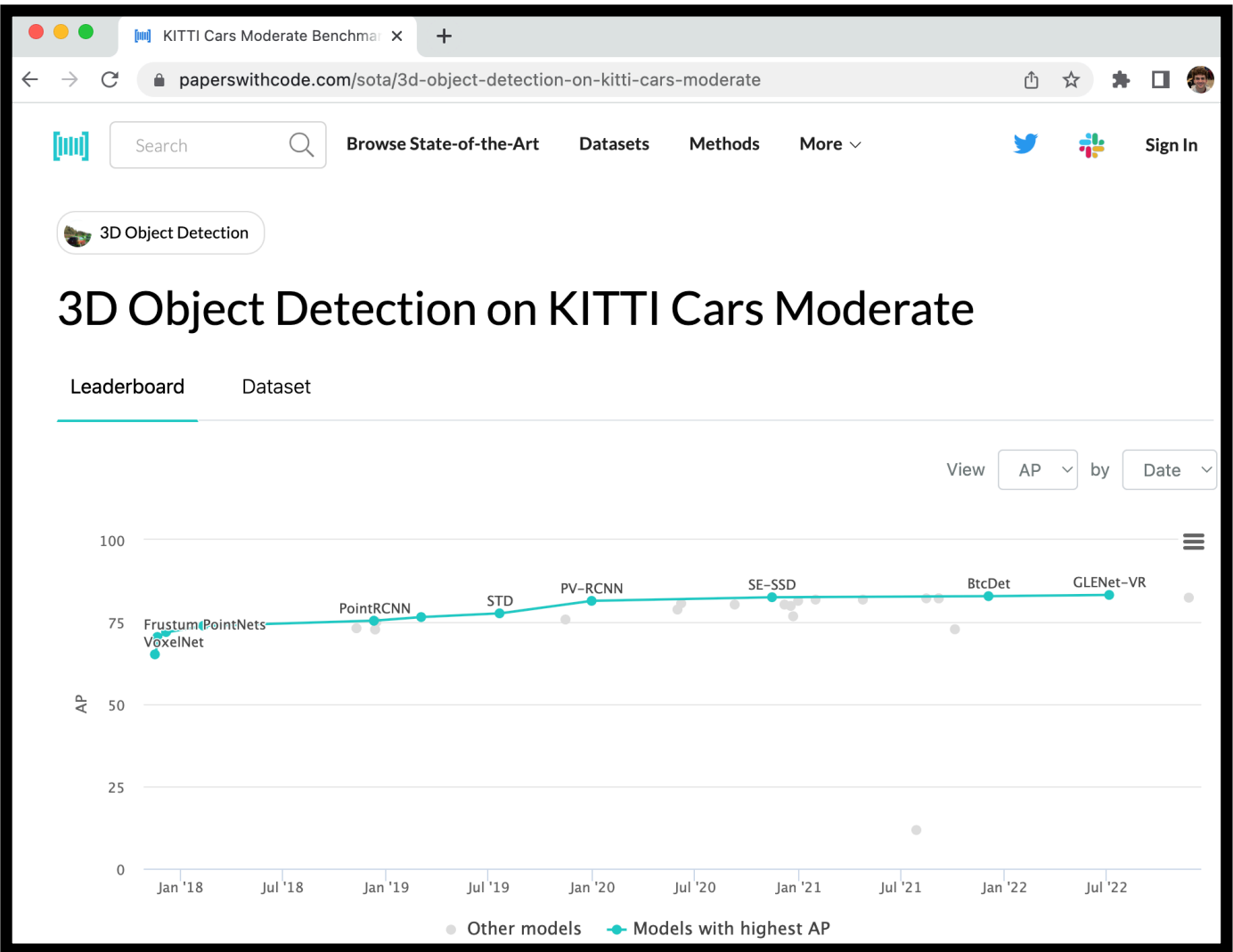
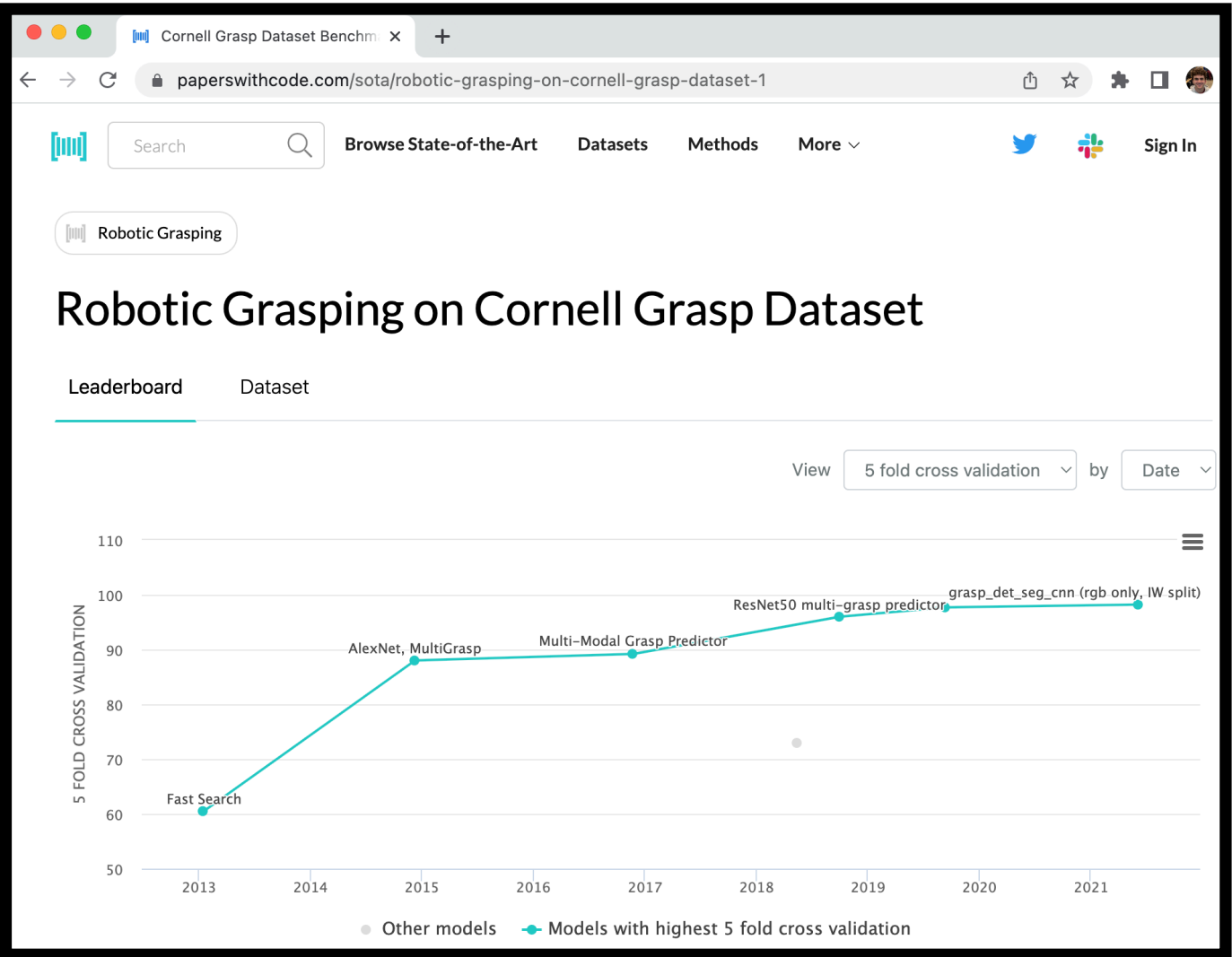
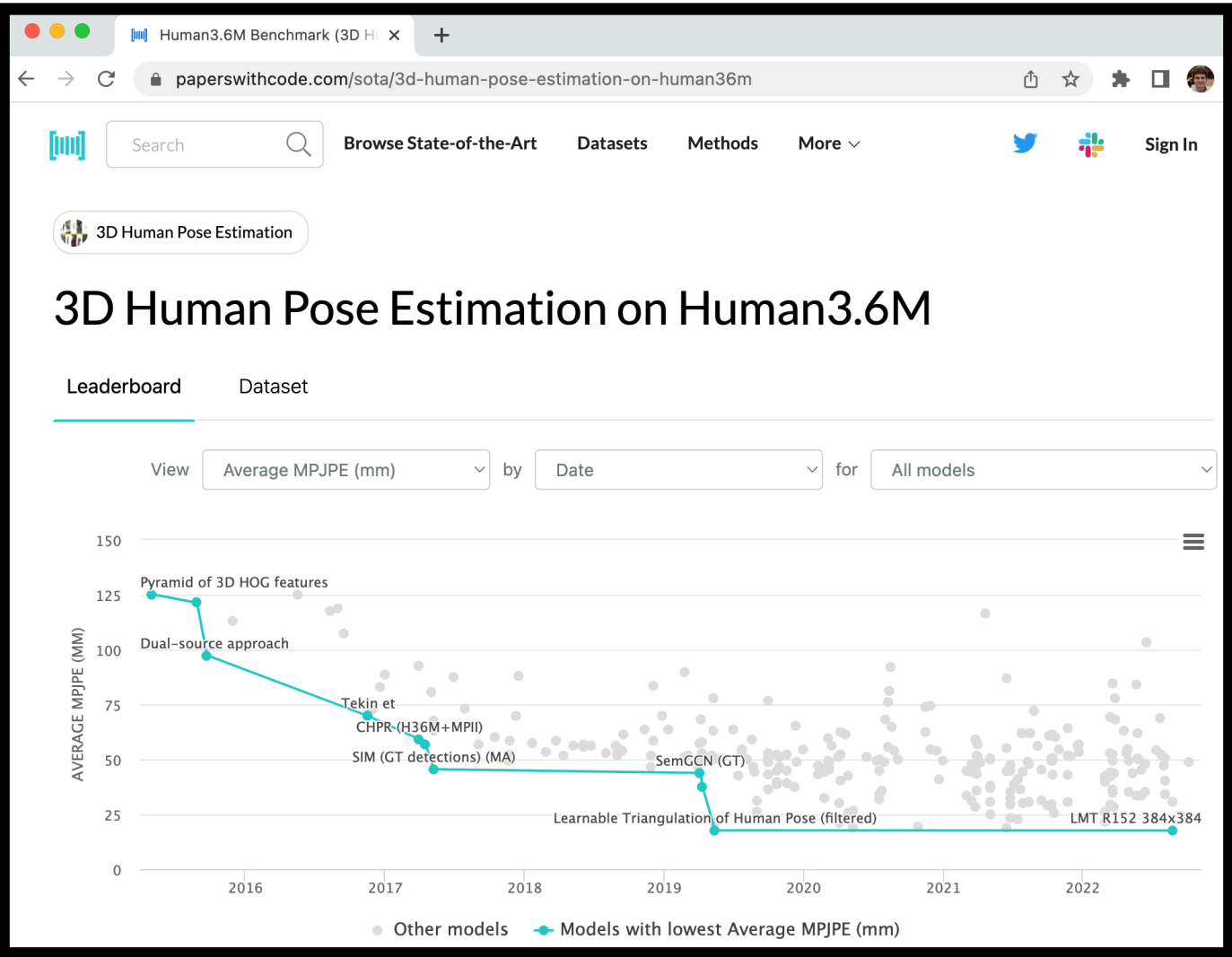
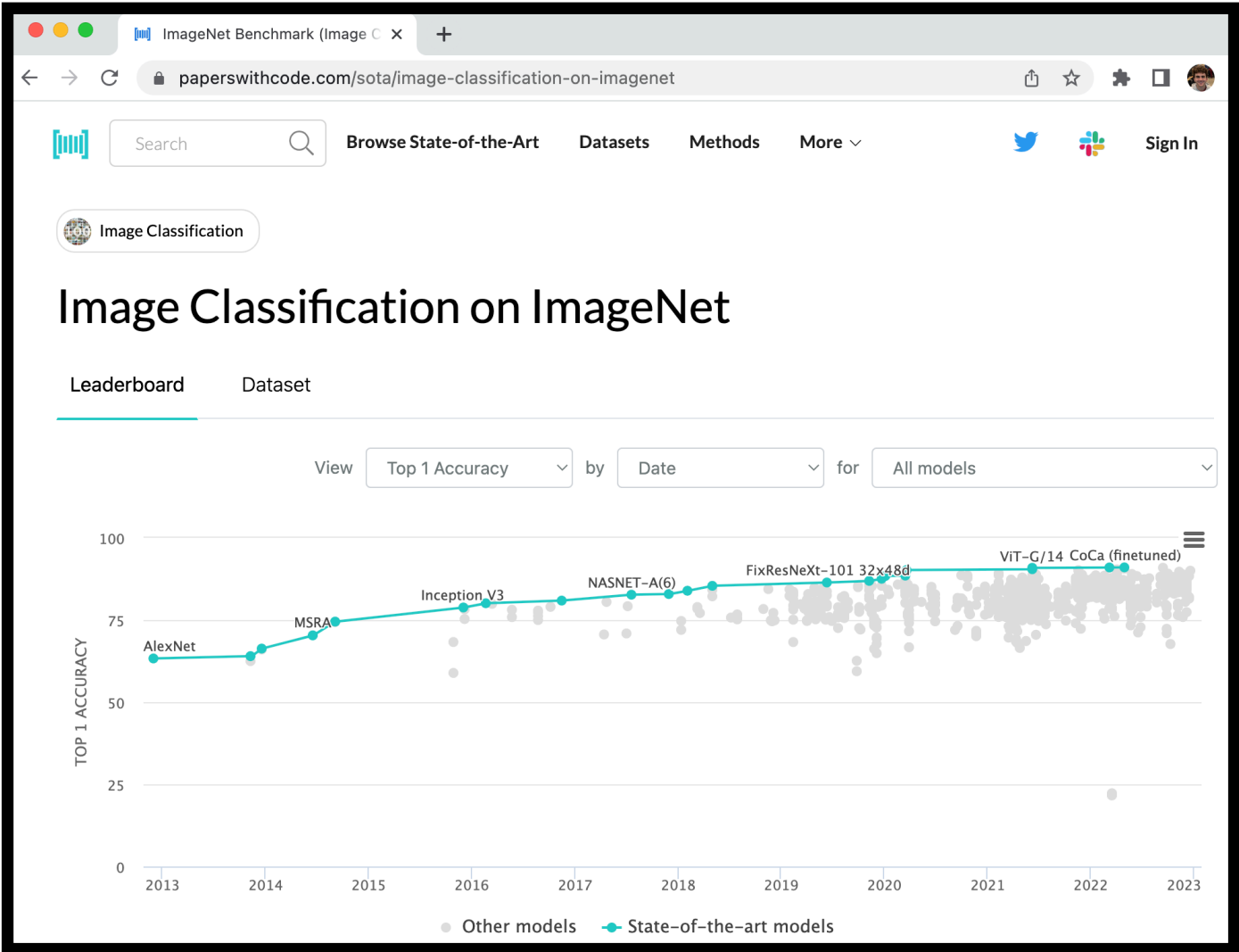
- The importance of reading papers
- How to approach research papers in deep learning
- Discussion of AlexNet, PoseCNN and NeRF

Reading Papers is an Important Skill

- Applied Side
 - Practitioners want state of the art performance
 - Look to academia for what exists and how it can be replicated
- Research Side
 - Understand the field as a way to find ideas for contributing
 - New datasets, techniques, methods defined by research community



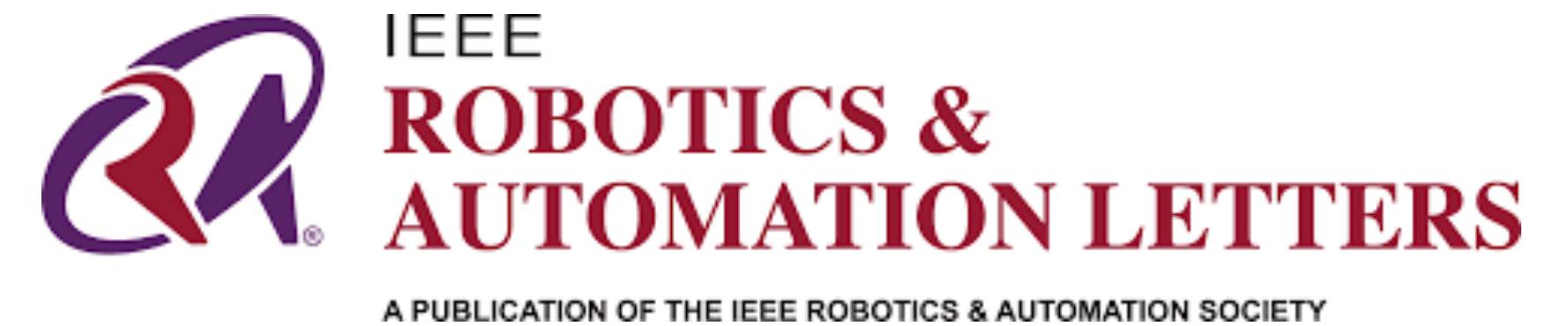
State of the Art is Always Changing



Where to Look for Deep Learning Papers in Robotics?

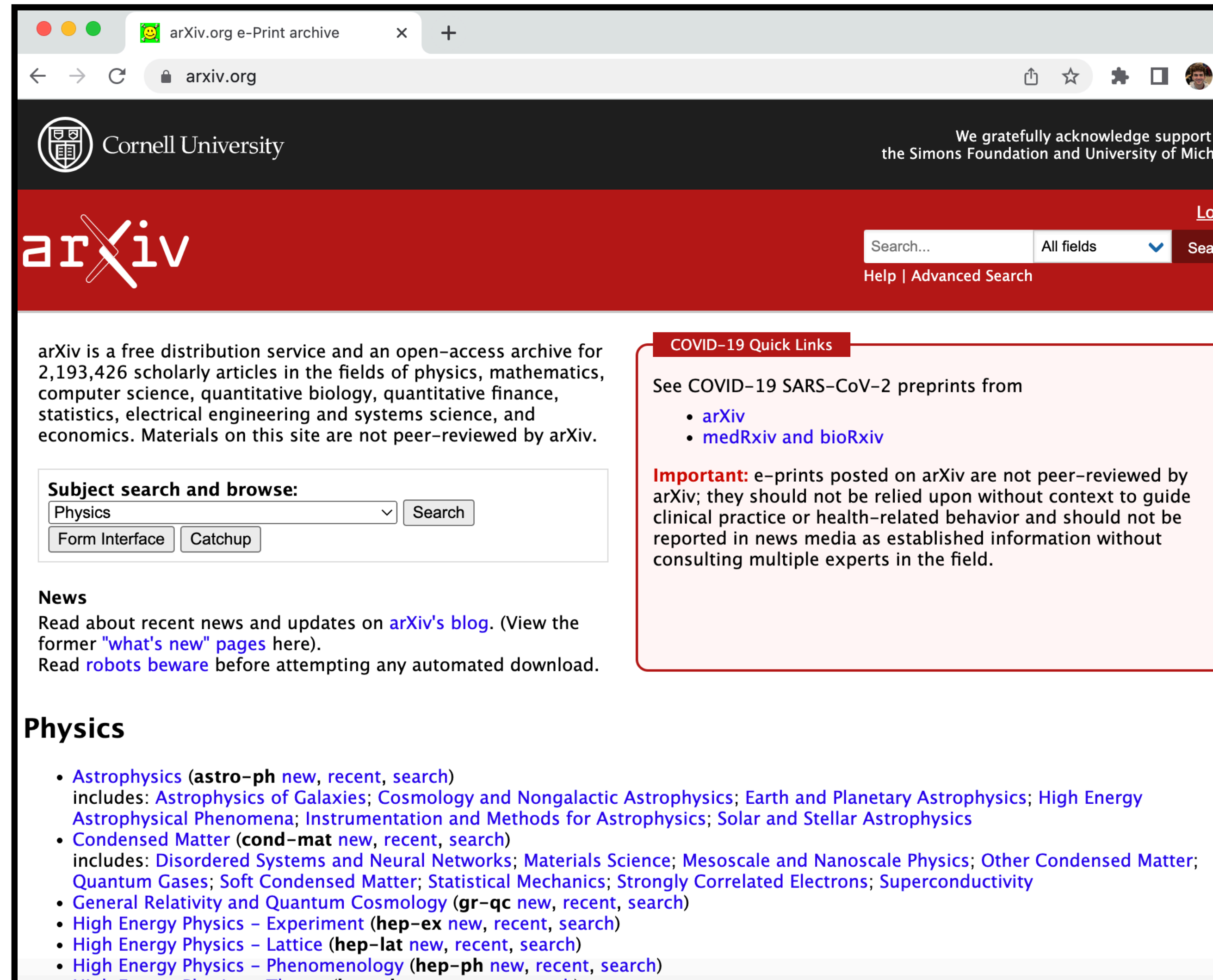


Science Robotics



iROS is in Detroit this year!

Where to Look for Deep Learning Papers in Robotics?



The screenshot shows the arXiv.org website in a web browser. The browser tab is labeled "arXiv.org e-Print archive" and the address bar shows "arxiv.org". The website header includes the Cornell University logo and a search bar with the text "Search..." and a dropdown menu set to "All fields". Below the header, the arXiv logo is prominently displayed. A red box on the right side of the page contains a "COVID-19 Quick Links" section with the text: "See COVID-19 SARS-CoV-2 preprints from" followed by links to "arXiv" and "medRxiv and bioRxiv". Below this, an "Important" notice states: "e-prints posted on arXiv are not peer-reviewed by arXiv; they should not be relied upon without context to guide clinical practice or health-related behavior and should not be reported in news media as established information without consulting multiple experts in the field." On the left side, there is a "Subject search and browse:" section with a dropdown menu currently set to "Physics" and a "Search" button. Below this, there are links for "Form Interface" and "Catchup". Further down, a "News" section provides information about recent updates and a warning about automated downloads. At the bottom, a "Physics" section lists various subfields with links to "new", "recent", and "search" pages for each.

arXiv.org e-Print archive

arxiv.org

Cornell University

We gratefully acknowledge support from the Simons Foundation and University of Michigan

arXiv

Search... All fields Search

Help | Advanced Search

arXiv is a free distribution service and an open-access archive for 2,193,426 scholarly articles in the fields of physics, mathematics, computer science, quantitative biology, quantitative finance, statistics, electrical engineering and systems science, and economics. Materials on this site are not peer-reviewed by arXiv.

Subject search and browse:

Physics Search

Form Interface Catchup

News

Read about recent news and updates on [arXiv's blog](#). (View the former "what's new" [pages](#) here).

Read [robots beware](#) before attempting any automated download.

COVID-19 Quick Links

See COVID-19 SARS-CoV-2 preprints from

- [arXiv](#)
- [medRxiv and bioRxiv](#)

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Physics

- [Astrophysics \(astro-ph new, recent, search\)](#)
includes: [Astrophysics of Galaxies](#); [Cosmology and Nongalactic Astrophysics](#); [Earth and Planetary Astrophysics](#); [High Energy Astrophysical Phenomena](#); [Instrumentation and Methods for Astrophysics](#); [Solar and Stellar Astrophysics](#)
- [Condensed Matter \(cond-mat new, recent, search\)](#)
includes: [Disordered Systems and Neural Networks](#); [Materials Science](#); [Mesoscale and Nanoscale Physics](#); [Other Condensed Matter](#); [Quantum Gases](#); [Soft Condensed Matter](#); [Statistical Mechanics](#); [Strongly Correlated Electrons](#); [Superconductivity](#)
- [General Relativity and Quantum Cosmology \(gr-qc new, recent, search\)](#)
- [High Energy Physics - Experiment \(hep-ex new, recent, search\)](#)
- [High Energy Physics - Lattice \(hep-lat new, recent, search\)](#)
- [High Energy Physics - Phenomenology \(hep-ph new, recent, search\)](#)

Publishing Never Stops

The image is a screenshot of a web browser window displaying an email. The browser's address bar shows 'mail.google.com'. The email is from the University of Michigan Mail, with the subject line 'cs daily Subj-class mailing 90400c0 1'. The email header indicates it was received on 'Fri, Jan 20, 2023 at 3:40 AM'. The body of the email contains the following text: 'send mail ONLY to cs <no-reply@arxiv.org>', 'Reply-To: cs@arxiv.org', 'To: cs daily title/abstract distribution <rabbie@arxiv.org>', 'Send any comments regarding submissions directly to submitter.', 'Archives at http://arxiv.org/', 'To unsubscribe, e-mail To: cs@arXiv.org, Subject: cancel', 'Submissions to:', 'Computer Vision and Pattern Recognition', 'Computers and Society', 'Machine Learning', 'Neural and Evolutionary Computing', 'Robotics', 'received from Wed 18 Jan 23 19:00:00 GMT to Thu 19 Jan 23 19:00:00 GMT', 'arXiv:2301.07805', 'Date: Wed, 18 Jan 2023 22:27:08 GMT (2520kb,D)', 'Title: Multi-target multi-camera vehicle tracking using transformer-based camera link model and spatial-temporal information', 'Authors: Hsiang-Wei Huang, Jenq-Neng Hwang', 'Categories: cs.CV', and 'Multi-target multi-camera tracking (MTMCT) of vehicles, i.e. tracking vehicles across multiple cameras, is a crucial application for the development of smart city and intelligent traffic system. The main challenges of MTMCT of vehicles include the intra-class variability of the same vehicle and inter-class similarity between different vehicles and how to associate the same'.

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arxiv: 1/190

topipari@umich.edu

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send mail ONLY to cs <no-reply@arxiv.org> Fri, Jan 20, 2023 at 3:40 AM
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Computers and Society
Machine Learning
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190

>190 new papers
in the last 24 hours

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Robotics

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How to Read Deep Learning Research Papers?

Everyone develops their own style over time

Questions I Consider When Reading a Paper

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How were these results achieved? Using which techniques evaluated under which methods?

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What are the key results?

How were these results achieved? Using which techniques evaluated under which methods?

What problems, questions, or findings could be expanded on as future work?

Discussion: AlexNet

ImageNet Classification with Deep Convolutional Neural Networks

Alex Krizhevsky

University of Toronto

`kriz@cs.utoronto.ca`

Ilya Sutskever

University of Toronto

`ilya@cs.utoronto.ca`

Geoffrey E. Hinton

University of Toronto

`hinton@cs.utoronto.ca`

Discussion: PoseCNN

PoseCNN: A Convolutional Neural Network for 6D Object Pose Estimation in Cluttered Scenes

Yu Xiang^{1,2}, Tanner Schmidt², Venkatraman Narayanan³ and Dieter Fox^{1,2}

¹NVIDIA Research, ²University of Washington, ³Carnegie Mellon University
yux@nvidia.com, tws10@cs.washington.edu, venkatraman@cs.cmu.edu, dieterf@nvidia.com

Discussion: NeRF

NeRF: Representing Scenes as Neural Radiance Fields for View Synthesis

Ben Mildenhall^{1*} Pratul P. Srinivasan^{1*} Matthew Tancik^{1*}
Jonathan T. Barron² Ravi Ramamoorthi³ Ren Ng¹

¹UC Berkeley ²Google Research ³UC San Diego



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