



Machine Learning & Deep Learning in Python

Monday, Sep 18 | 9:00 AM - 5:00 PM CDT



posit
conf (2023)



📍 HYATT REGENCY CHICAGO

Workshop Goals:

Understanding when to use
Machine Learning vs **Deep Learning**

Being comfortable with how
Scikit-learn & **PyTorch** work

Schedule

Block 3 (1:30 - 3:00 pm)

(5) Introduction to Deep Learning

(6) Understanding PyTorch

(7) Training Deep Neural Networks

30 min break (3:00 - 3:30 pm)

Schedule

Block 4 (3:30 - 5:00 pm)

(8) Accelerating PyTorch Model Training

(9) Finetuning Large Language Models

100% Open Source

When do we use **deep learning** vs **regular machine learning**?

Deep learning

large datasets
in “unstructured” form
(e.g., images and text)



https://en.wikipedia.org/wiki/Crow#/media/File:Corvus_corone_-_near_Canford_Cliffs,_Poole,_England-8.jpg



<https://abcbirds.org/blog21/what-do-crows-eat/>



<https://audubonportland.org/our-work/rehabilitate-wildlife/having-a-wildlife-problem/urban-crows/downtown-crows/>



https://www.allaboutbirds.org/guide/American_Goldfinch/id



<https://kids.nationalgeographic.com/animals/birds/facts/american-goldfinch>



https://www.allaboutbirds.org/guide/American_Goldfinch/photo-gallery/63737331

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Regular machine learning

Datasets in “structured”
form like tables

	Beak length	Wing span	Primary color	...
Bird 1	3 cm	43 cm	black	...
Bird 2	0.5 cm	19 cm	yellow	...
Bird 3	5 cm	48 cm	black	...
Bird 4	4 cm	45 cm	black	...
...

Regular machine learning

“Unstructured” data



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Manual feature extraction



Datasets in “structured” form like tables

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Bird 4	4 cm	45 cm	black	...
...

A large language model (LLM) is

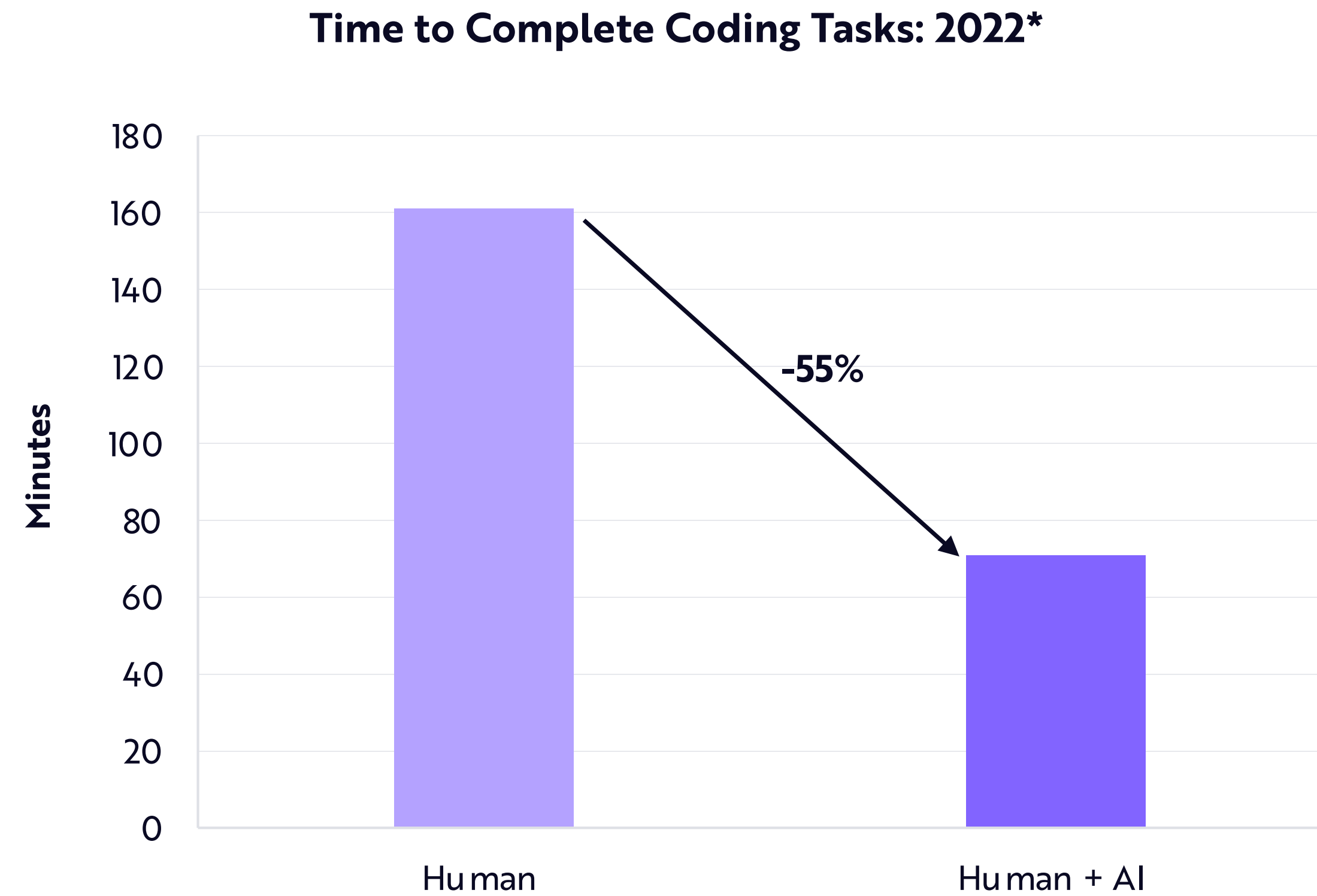
**... a “large” deep neural network
(7B to 1T parameters or more)**

... often based on the transformer architecture

Increasing productivity!?

Coding Assistants

Software engineers completed a coding task in less than half the time with AI coding assistant GitHub Copilot.



Source: <https://ark-invest.com/home-thank-you-big-ideas-2023/>

*Based on data from GitHub. **Generative AI models translated "a picture of an astronaut on Mars" into multiple images in just a few seconds. Sources: ARK Investment Management LLC, 2023. Kalliamvakou, E. 2022. Forecasts are inherently limited and cannot be relied upon. For informational purposes only and should not be considered investment advice or a recommendation to buy, sell, or hold any particular security. Past performance is not indicative of future results.