The human loop in machine learning

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GDG

Agenda

- The era of AutoML: Automating the automation
- Machine learning: From a software engineer's keystrokes
- Demystifying the human involvement in machine learning projects
- A primer to active learning
- Machine Learning-Assisted Humans vs Human-Assisted Machine Learning
- Guiding lights

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- The era of AutoML: Automating the automation
- Machine learning: From a software engineer's keystrokes
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- No NeurIPS papers today!

A for AutoML

- “The automation of automating automation” - Sebastian Raschka
  - Automating the hyperparameter tuning process

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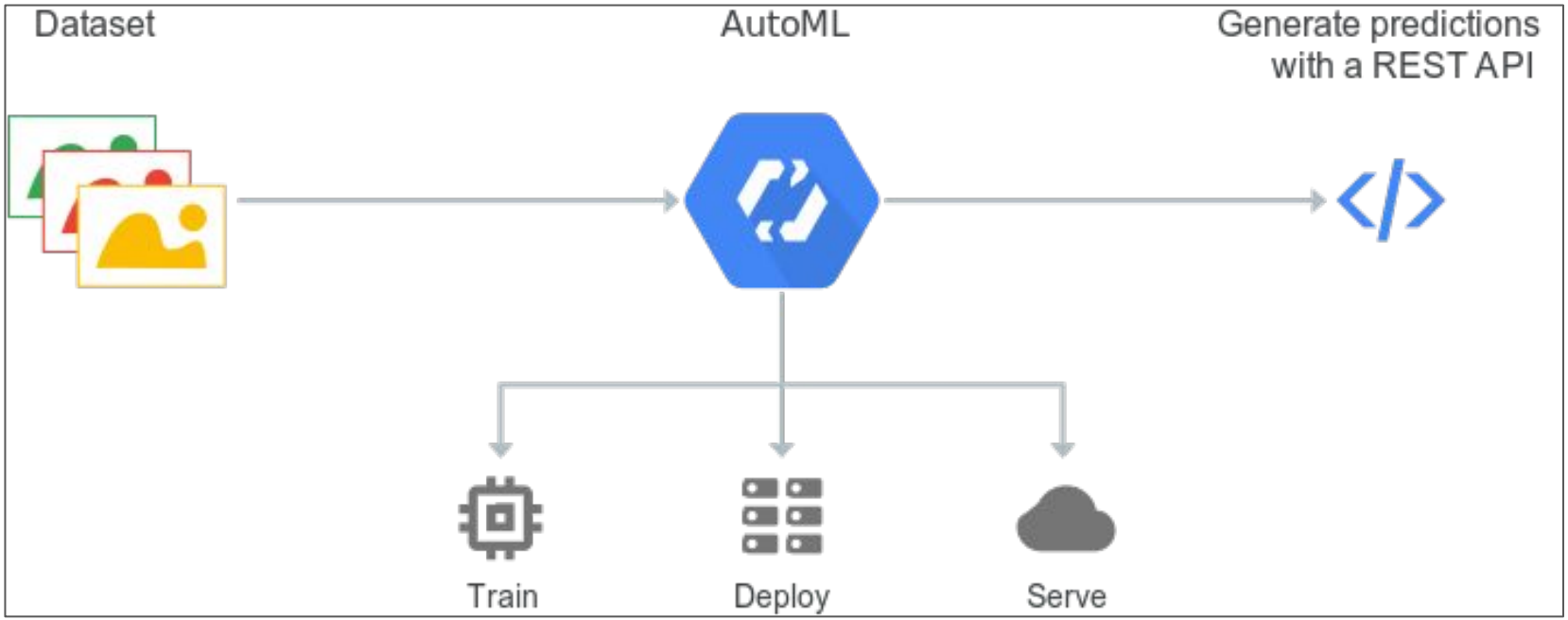
  - Automating the hyperparameter tuning process
  - Given a dataset find the most suitable machine learning architecture (NAS)

A for AutoML



Source: https://cloud.google.com/automl/

Where do the humans stand then?

Life-cycle of a machine learning project

- Problem understanding
- Data collection, wrangling and so on
- Understanding of the data
- Beginning the modeling process
- Evaluate, tune, repeat
- Model in production

Note that the above steps are *typical*

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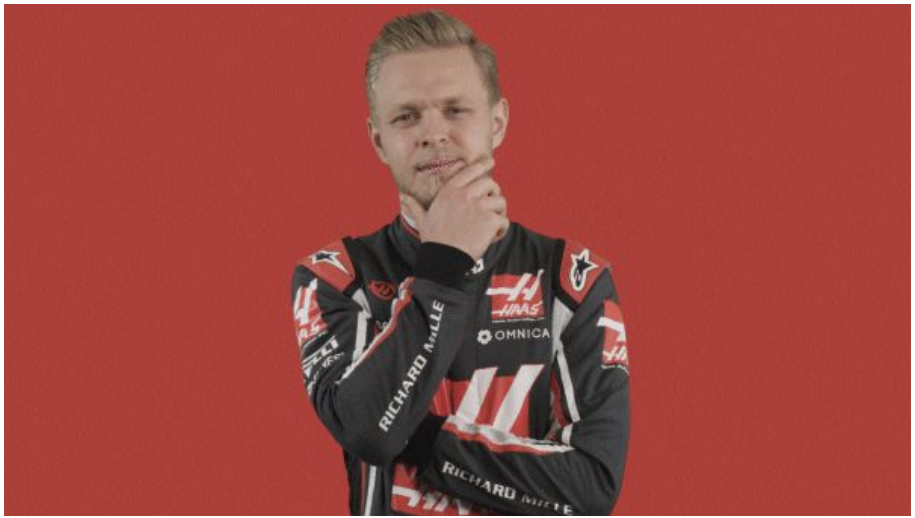
But how do we know if a problem is suitable for machine learning?

Demystifying the human involvement in machine learning projects

Problem framing is a scientific process

1.	Frame the problem:	What will traffic be like tomorrow?
2.	Make a hypothesis:	Weather forecast could be informative.
3.	Collect the data:	Collect historical traffic and weather data.
4.	Test hypothesis:	Test a model with the data
5.	Analyze results:	Is this model better than existing systems?
6.	Reach a conclusion:	I should (not) use this model, because of X, Y, and Z.
7.	Refine and repeat	Time of year could be a helpful signal.



Can a machine automate this process?

Using heuristics

- Is it possible to solve the problem without machine learning?

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Using heuristics

- Is it possible to solve the problem without machine learning?
- Why deploy a model if it cannot beat a heuristic?
- Non-ML solutions can sometimes be *simpler* to maintain than ML solutions.

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It helps improving the overall **speed** and **cost** of training data!

Machine Learning-Assisted

Humans vs Human-Assisted

Machine Learning

Machine learning & human involvement

- Making a Machine Learning application more accurate with human input

Machine learning & human involvement

- Making a Machine Learning application more accurate with human input
- Improving a human task with the aid of Machine Learning

Wrapping up

- Automated machine learning
- More human involvement in machine learning
- The sweet rivalry

Some departing thoughts

- Can a machine perform machine learning research?

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- Can a machine perform data-driven model development?

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- Can a machine interpret a machine learning model?

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- ...

This list is long!

See you next time

Find me here:
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Thank you very much :)

Experts

pyimagesearch