MLOps NLP Study Sessions

TRANSFER LEARNING

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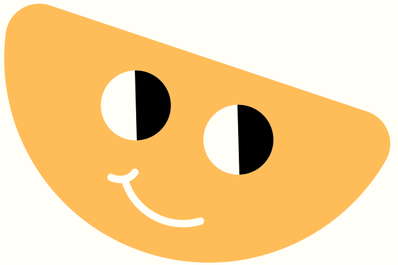
AGENDA

Presentation	25 min
QA session, discussion	15 min
Break	10 min
Discussion	20 min
Chat	20 min



WHAT IS TRANSFER LEARNING?

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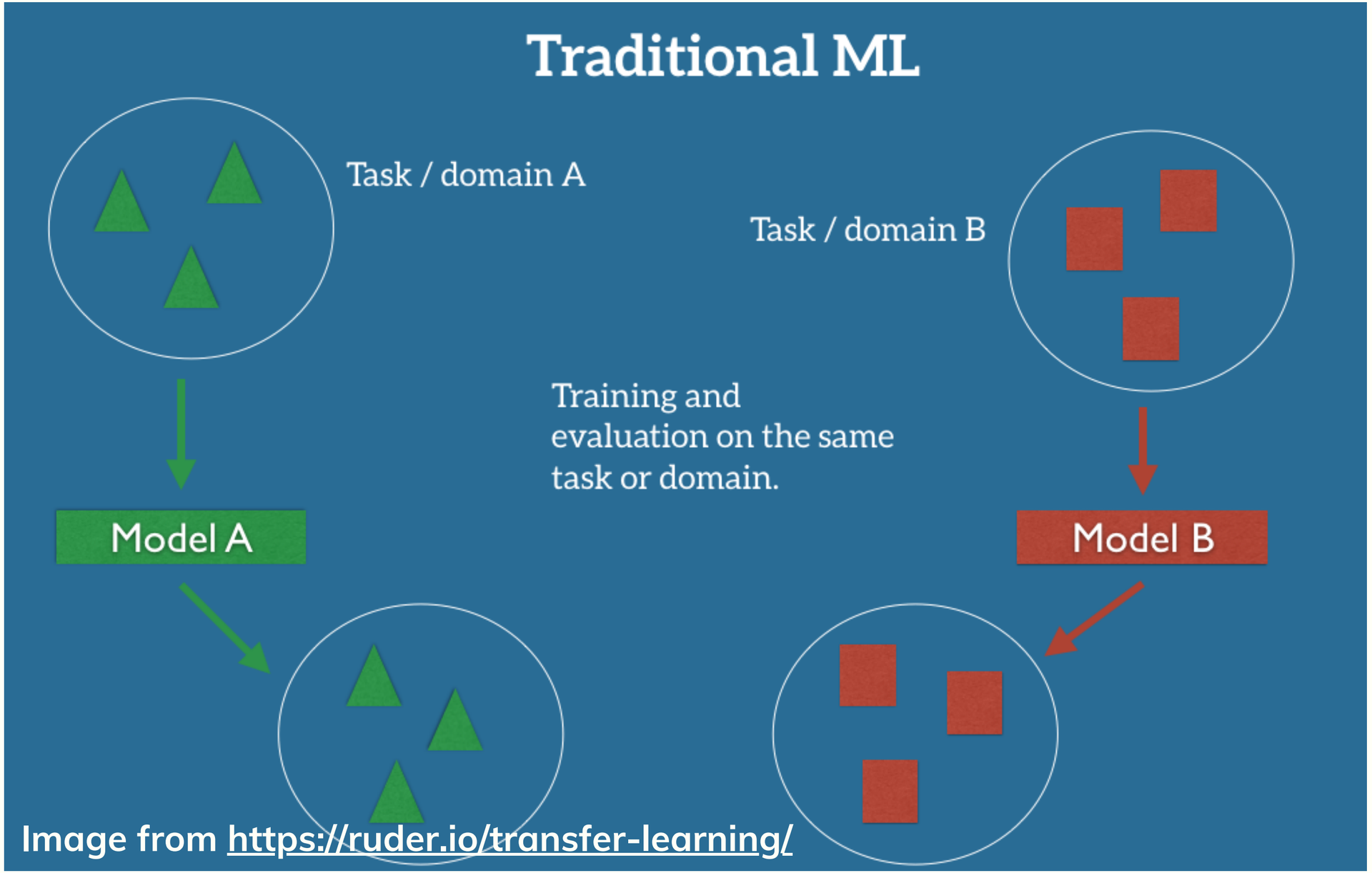
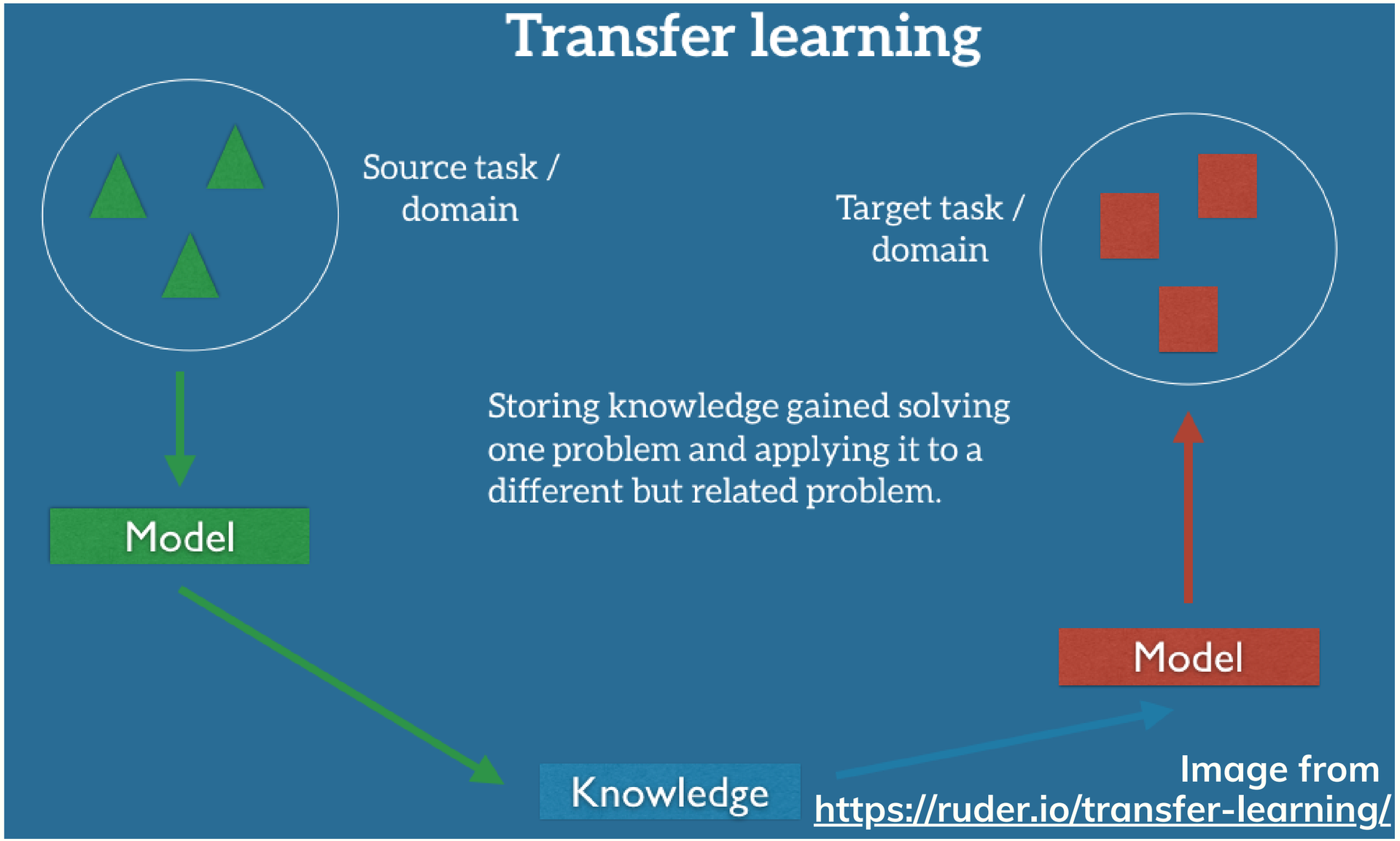
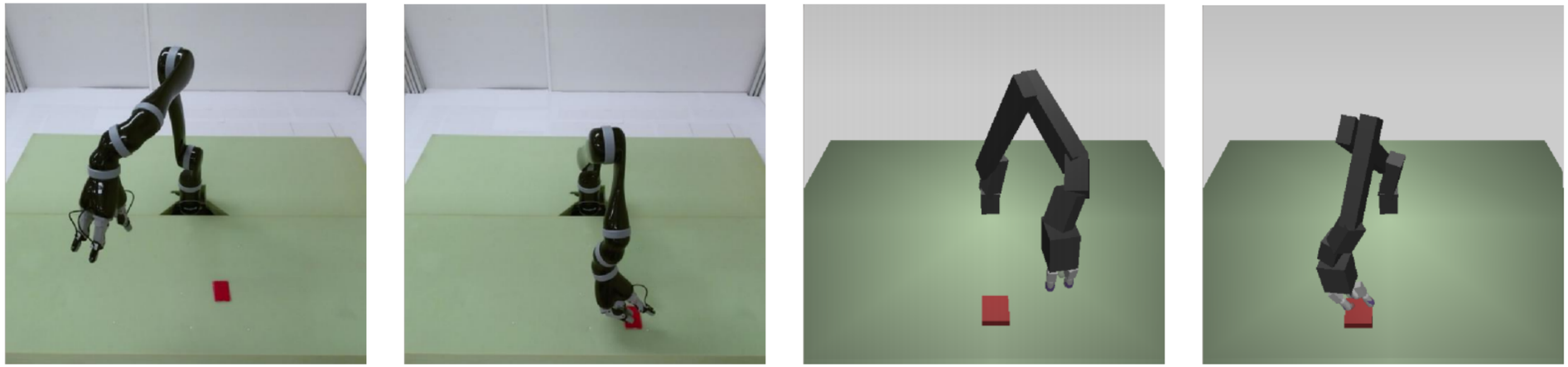


Image from https://ruder.io/transfer-learning/

WHAT IS TRANSFER LEARNING?



WHAT IS TRANSFER LEARNING?

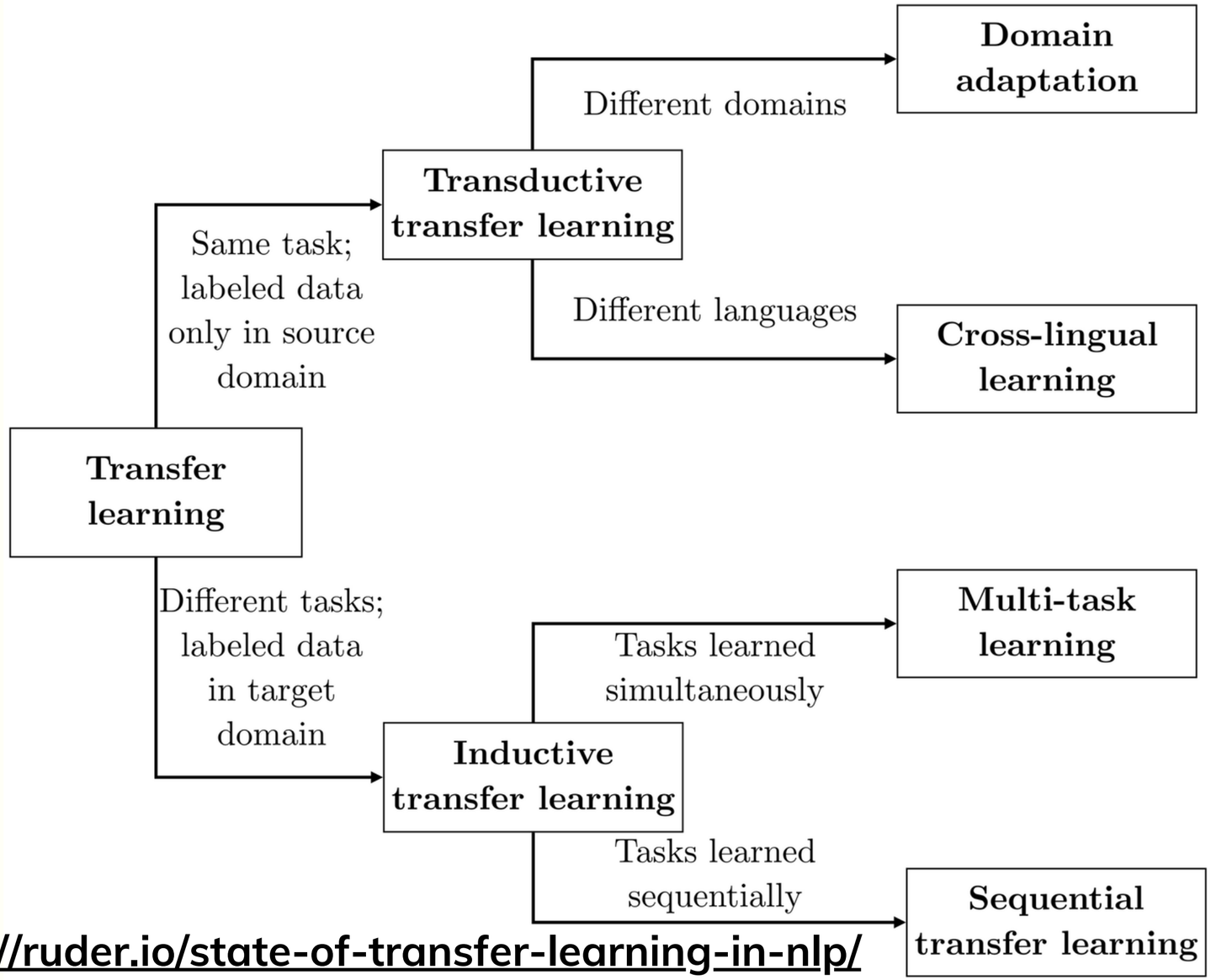


from "Sim-to-Real Robot Learning from Pixels with Progressive Nets", Rusu et al., 2016, https://arxiv.org/abs/1610.04286

from "Return of Frustratingly Easy Domain Adaptation", Sun et al., 2016, https://arxiv.org/abs/1511.05547

TRANSFER LEARNING IN NLP

TRANSFER LEARNING IN NLP



from https://ruder.io/state-of-transfer-learning-in-nlp/

Trends

- Contextualized word representations
- Language modeling (probability distribution over strings of text)
- Large scale models
- Choice of pre-training and target tasks

Pre-training

- **Self-supervised**
  - large training data
  - distributional hypothesis
  - language model-ish
  - efficient algorithms

- **Supervised**
  - lack of data
  - task-specific
  - machine translation

Target task

- Usually supervised
- Common NLP tasks
  - sentence / document classification
  - sentence pair classification
  - natural language generation
  - structured prediction
  - word-level tasks

Adaptation

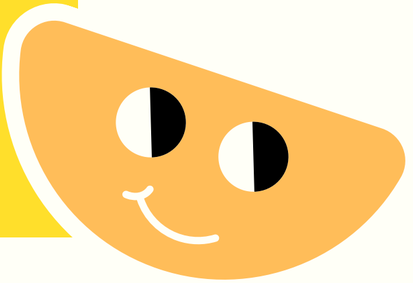
- **Architectural modifications**
  - keep internal structure
  - change internal structure
- **Optimization schemes**
  - feature extraction
  - fine-tuning
- **Getting more signal**
  - sequential adaptation
  - multi-task fine-tuning
  - data slicing, distilling, etc.

SOURCES

Transfer Learning in Natural Language Processing / NAACL 2019 Tutorial, https://vimeo.com/359399507

The State of Transfer Learning in NLP, Sebastian Ruder, 2019, https://ruder.io/state-of-transfer-learning-in-nlp/

Transfer Learning - Machine Learning's Next Frontier, Sebastian Ruder, 2017 https://ruder.io/transfer-learning/




Q
A

Discussion points

- Drawbacks of pretrained language models
- How to choose pre-training models?
- Meta-learning
- Bias in pre-trained models


C.H.AT