



Language
Technologies
Institute

Carnegie
Mellon
University

Chess Q&A : Question Answering on Chess Games

Reasoning, Attention, Memory
NIPS Workshop
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Volkan Cirik
Louis-Philippe Morency
Eduard Hovy

Visual Question Answering



Which city is pictured?

Malinowski et. al. 2015, Gao et. al. 2015, Ren et. al. 2015, Antol et. al. 2015

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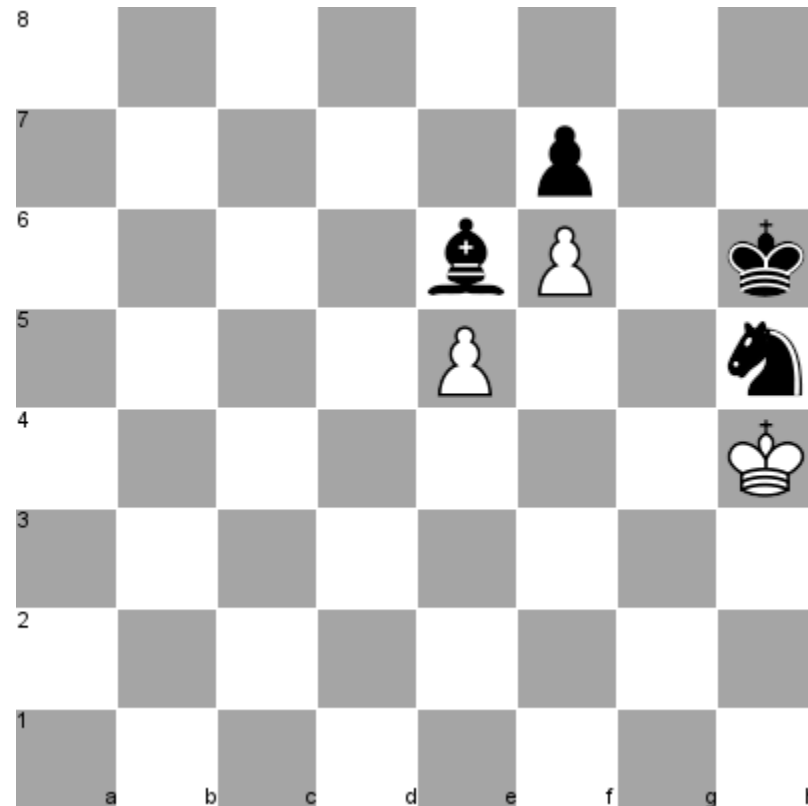
Abstract Scenes



Does the man have a good heart?

Antol et. al. 2015

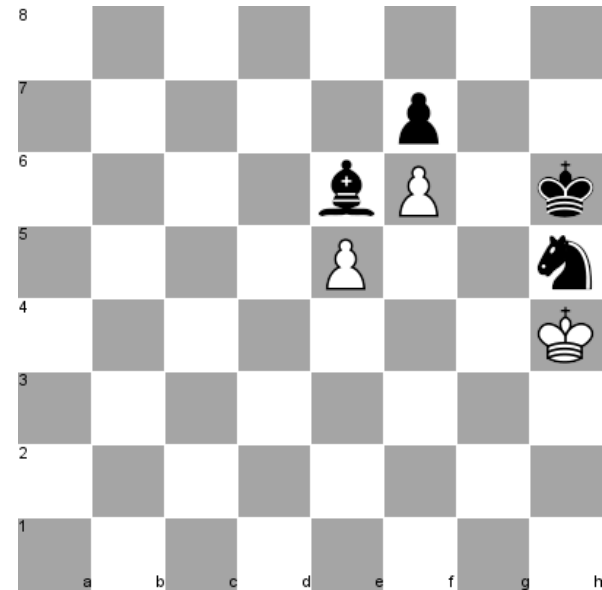
Chess Q&A



is this a stalemate?

Learning Setup

- sequence of moves
 - d4 d5 c4 e5 cxd5 Qxd5 ...
- board configuration
 - Image
 - FEN: 8/5p2/4bP1k/4P2n/7K/8/8/8
- question
 - “is this a stalemate?”



Question Types

- Position
 - What piece is on a2?
- Counting :
 - how many pieces on board?
 - how many pieces does white have?
 - is there any queen on the board?
 - What is the material advantage of black?
- Attacking and Moves
 - Which piece is attacking white bishop at a6?
 - Is b2g7 a legal move?
 - Is white in check?
- More Rules
 - Does black has castling rights?
 - Is this a checkmate?

Preparation of Dataset

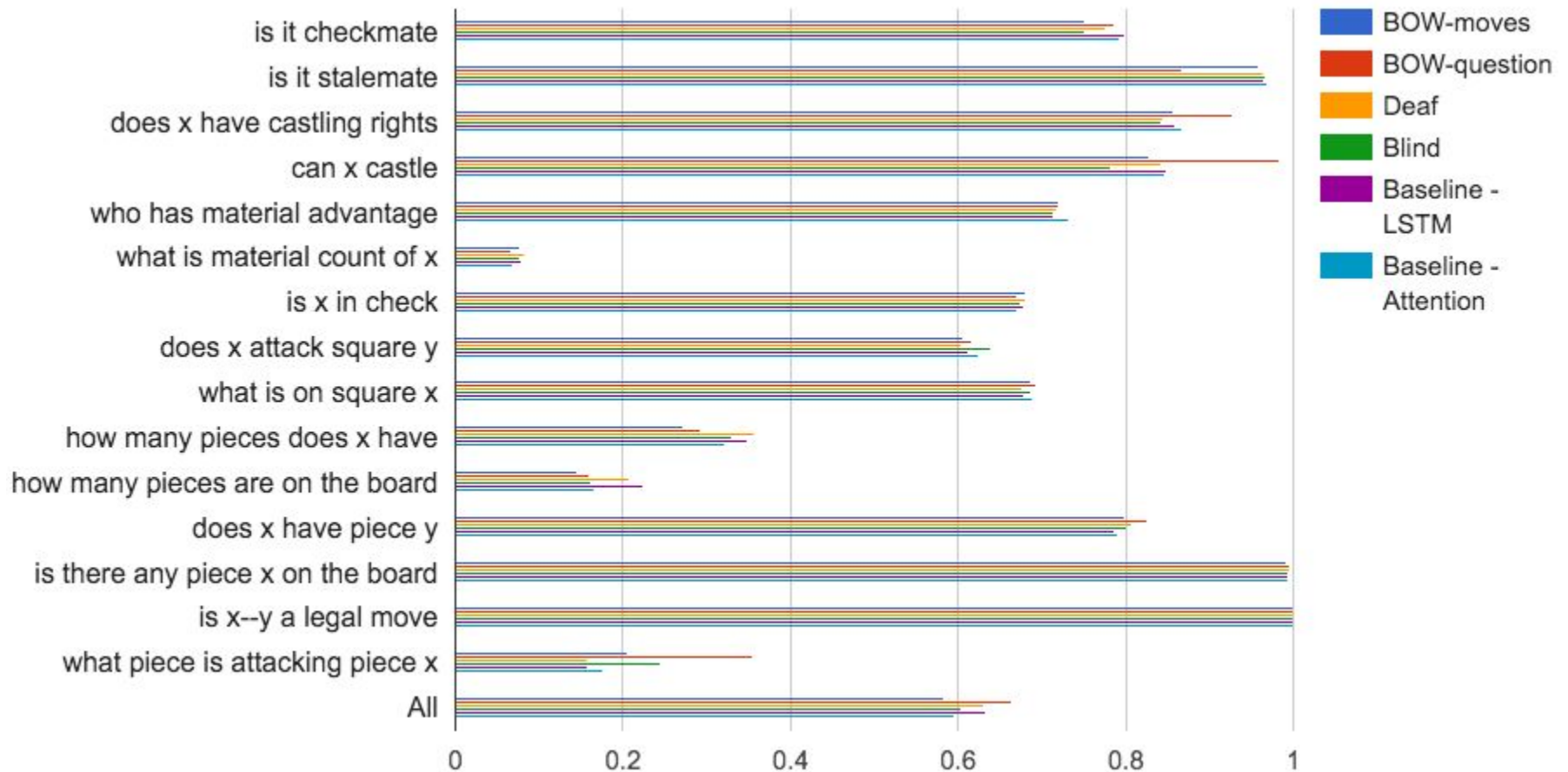
- Games are from **FICS Games Database**
- Questions are generated using **Python Chess Library**
- Board is visualized using **an open-source implementation**
- 15 types of questions and 1K questions for each

Baseline Models

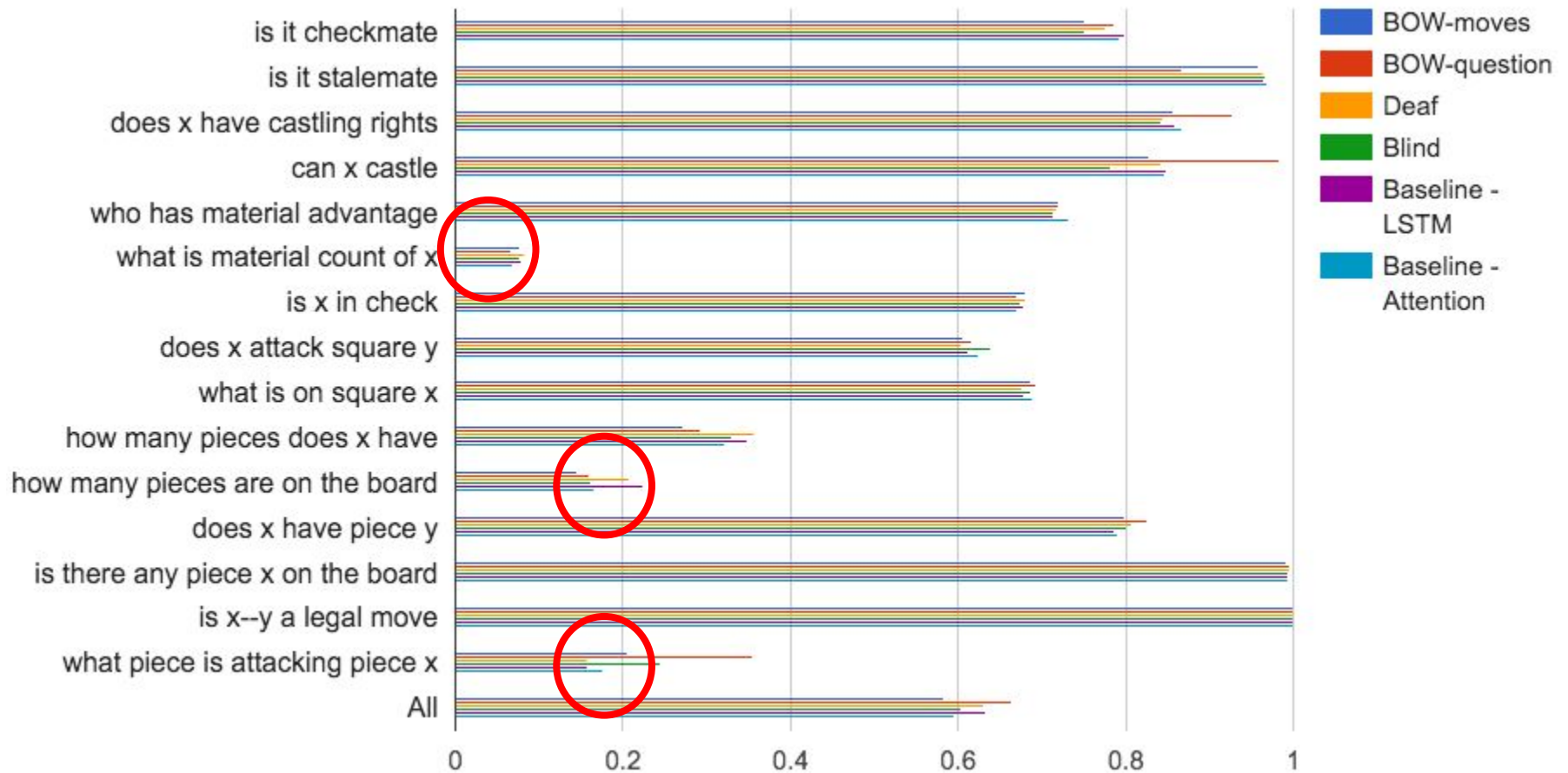
- **Baseline LSTM** : LSTM encoder on moves and question + board configuration and MLP on top of them
- **Deaf** : baseline without LSTM encoder on moves
- **Blind** : baseline without board configuration
- **Bag-of-words (BOW)-m** : bow features on moves instead of LSTM encoder
- **Bag-of-words (BOW)-q** : bow features on question instead of LSTM encoder
- **Attention** : Attention layer on moves and question

[Ren et. al. 2015]

Results



Results



Conclusion

- Synthetic Q&A dataset 15K questions with 15 types
<http://goo.gl/wXeb0V>
- Open-source : both data and the script
- Future Work
 - Analysis of models with visualizations
 - Curriculum Setup
 - Learn a KB of chess or learn from a KB?

Son

?