

# Chalmers Machine Learning Seminars

Olof Mogren

September 2016

# ACL 2016 overview

- Title statistics:



# ACL 2016 overview

- Title statistics:
  - LSTM+RNN+Neural Networks: 57+43



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  - Embeddings: 57+62





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- Visitors: ~1700



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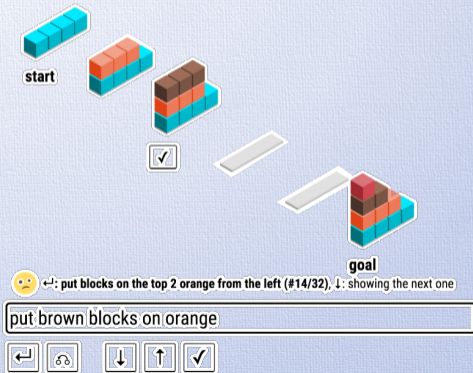
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- Tracks: ~7



# Learning language games through interactions

Sida I. Wang, Percy Liang, Christopher D. Manning

- Outstanding paper award

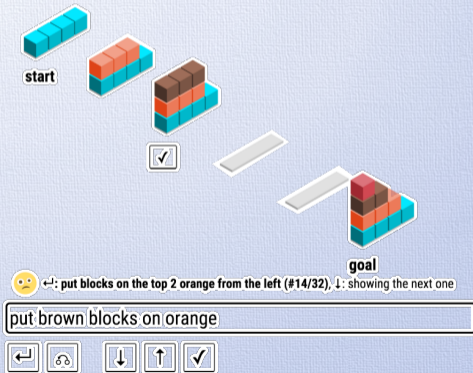




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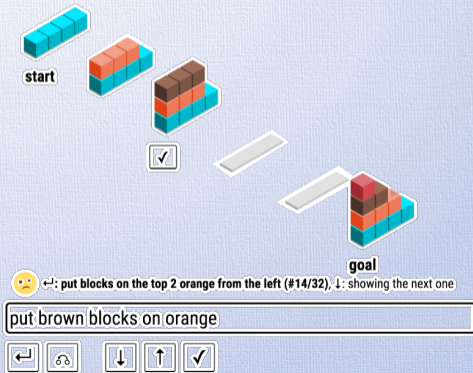
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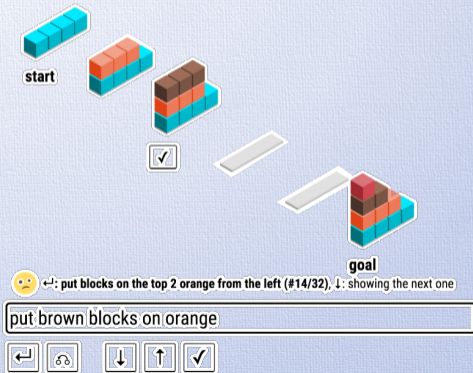
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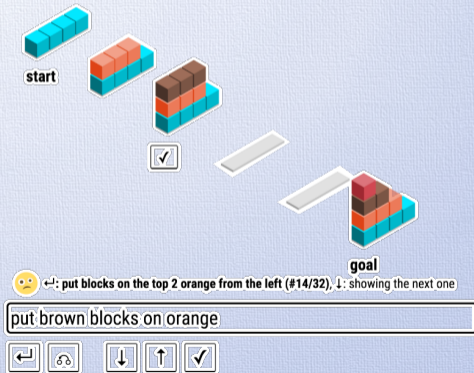




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- Outstanding paper award
- User knows goal, but needs computer to take actions
- Computer does not know the goal, and not the language
- User enters commands in their language of choice
- Pragmatics: Modelling mutual exclusivity



# Learning language games through interactions

Sida I. Wang, Percy Liang, Christopher D. Manning

- Features: cross product of

## Rule

Set

Color

Color  $\rightarrow$  Set

Set  $\rightarrow$  Set

Set  $\rightarrow$  Set

Set Color  $\rightarrow$  Act

Set  $\rightarrow$  Act

## Semantics

`all()`

`cyan|brown|red|orange`

`with(c)`

`not(s)`

`leftmost(s)|rightmost(s)`

`add(s,c)`

`remove(s)`

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- Log-linear model:

$$p_{\theta}(z|x) \propto \exp(\theta^T \phi(x, z))$$

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  - $n$ -gram features of input
  - Tree-gram features of parses
- Log-linear model:  
 $p_{\theta}(z|x) \propto \exp(\theta^T \phi(x, z))$
- Gradient updates

## Rule

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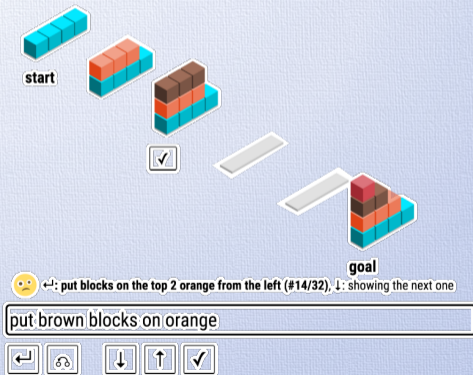
`remove(s)`



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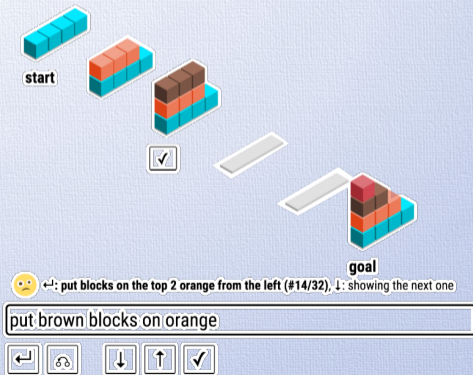
- That was probably the most fun thing I have ever done on mTurk.



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- That was probably the most fun thing I have ever done on mTurk.
- Wow this was one mind bending games [sic].



# Lifetime achievement award

- Joan Bresnan, Stanford





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- Supervisor of Chris Manning
- “Out of the garden, into the bush”



# Joan Bresnan's talk

“Out of the garden, into the bush ”

- Data shock



# Joan Bresnan's talk

“Out of the garden, into the bush ”

- Data shock
- Inspiration from neural network researchers





# Joan Bresnan's talk

“The first shock was my discovery that universal principles of grammar may be inconsistent and conflict with each other ”

# Joan Bresnan's talk

passive optional:	He hits him	He is hit by him
passive obligatory:	*He hit me	I am hit by him
active obligatory:	I hit him	*He is hit by me

# Joan Bresnan's talk

"You don't know how difficult it is to find something which will please everybody—especially the men. "

"Why not just **give them cheques?**" I asked. "

"You can't **give cheques to people.** It would be insulting. "

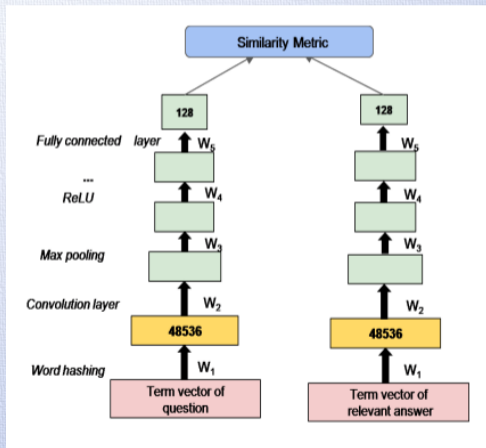


# Joan Bresnan's talk

“What I hope to see going forward are increasingly powerful applications of computational linguistic theory, techniques, and resources to deepen our understanding of human language and cognition. ”

# Other interesting papers

- **Together we stand: Siamese Networks for Similar Question Retrieval**, Arpita Das, Harish Yenala, Manoj Chinnakotla, and Manish Shrivastava
- **Assisting Discussion Forum Users using Deep Recurrent Neural Networks**, Jacob Hagstedt P Suorra, Olof Mogren



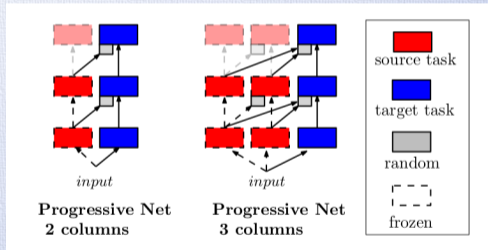
# REPL<sub>4</sub>NLP, Invited Speakers

- **Katrin Erk**, University of Texas
- **Animashree Anandkumar**, University of California Irvine
- **Hal Daumé III**, University of Maryland
- **Raia Hadsell**, Google Deepmind

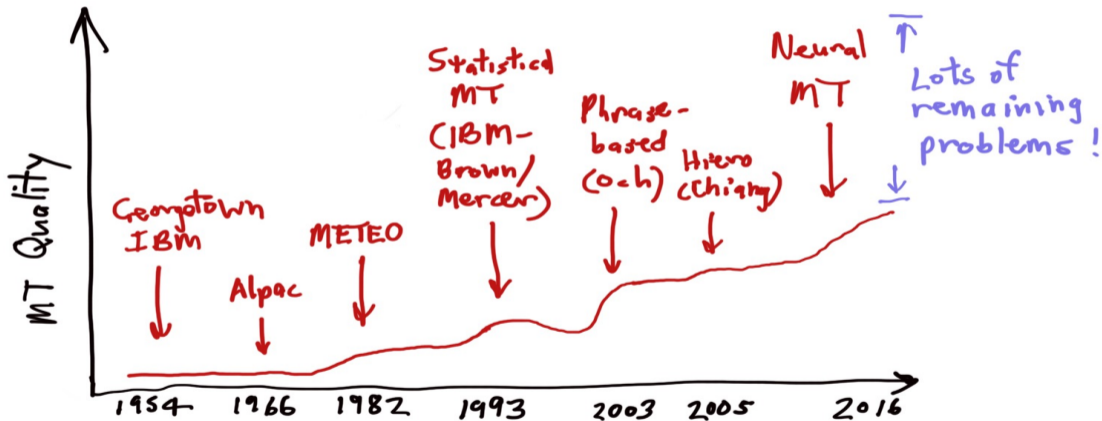


# Raia Hadsell, Google Deepmind

- lines are blurring. Examples:
  - Pixel Recurrent Neural Networks, Van den Oord et.al. (ICML 2016)
  - Conditional Image Generation with PixelCNN Decoders, van den Oord
- **Progressive nets**: transferring learning from one task to another



# Progress in MT



# And some more

- **Thorough examination of CNN/Daily Mail reading comprehension task** (outstanding paper), Danqi Chen, Jason Bolton, Chris Manning



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- **Thorough examination of CNN/Daily Mail reading comprehension task** (outstanding paper), Danqi Chen, Jason Bolton, Chris Manning
- **Diachronic Word Embeddings Reveal Statistical Laws of Semantic Change**, William Hamilton, Jure Leskovec and Dan Jurfsky

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- Time?

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- **Neural Machine Translation** Olof Mogren



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- Mikael Kågebäck?



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- **Causality**, Fredrik Johansson?
- **Joan Bresnan's work**, Prasanth Kolachina?
- Mikael Kågebäck?
- **Non-linear PCA/SVD/CCA**, "later this fall", Jonatan Kallus



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- **Non-linear PCA/SVD/CCA**, "later this fall", Jonatan Kallus
- **Suggestions**, The audience