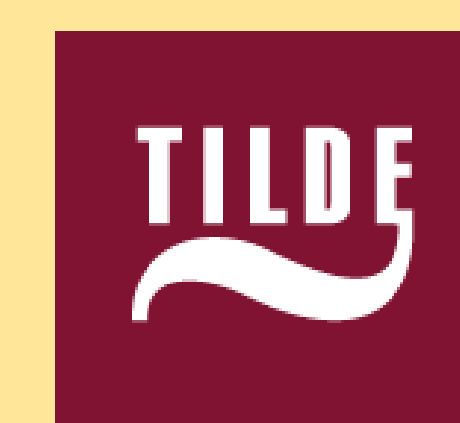


# Interactive Learning of Dialog Scenarios from Examples

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## Problem

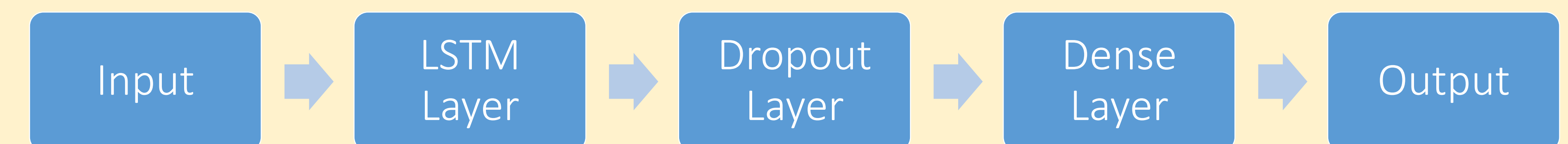
- Currently, machine learning techniques are used to train the models for intent detection and entity recognition, but dialog scenarios are usually created manually.
- We explore the methods that will allow VA dialog scenarios to be learned from examples.
- This paper reports on the development of a **toolkit that enables collecting dialog corpus for end-to-end goal-oriented dialog system training**.
- The toolkit includes **the neural network model that interactively learns to predict the next virtual assistant (VA) action from the conversation history**.

## Next action prediction model

Training data structure (for each turn in a dialog):

- **actor**: 'VA' or 'user'
- **utterance**: user utterance (as sentence vector);
- **entities**: key/value pairs representing variables and entities and their values;
- **action**: an action of VA (only for VA turns).

Model architecture



## Experiments

- English DSTC dialog corpus used for choosing the optimal architecture of the model.

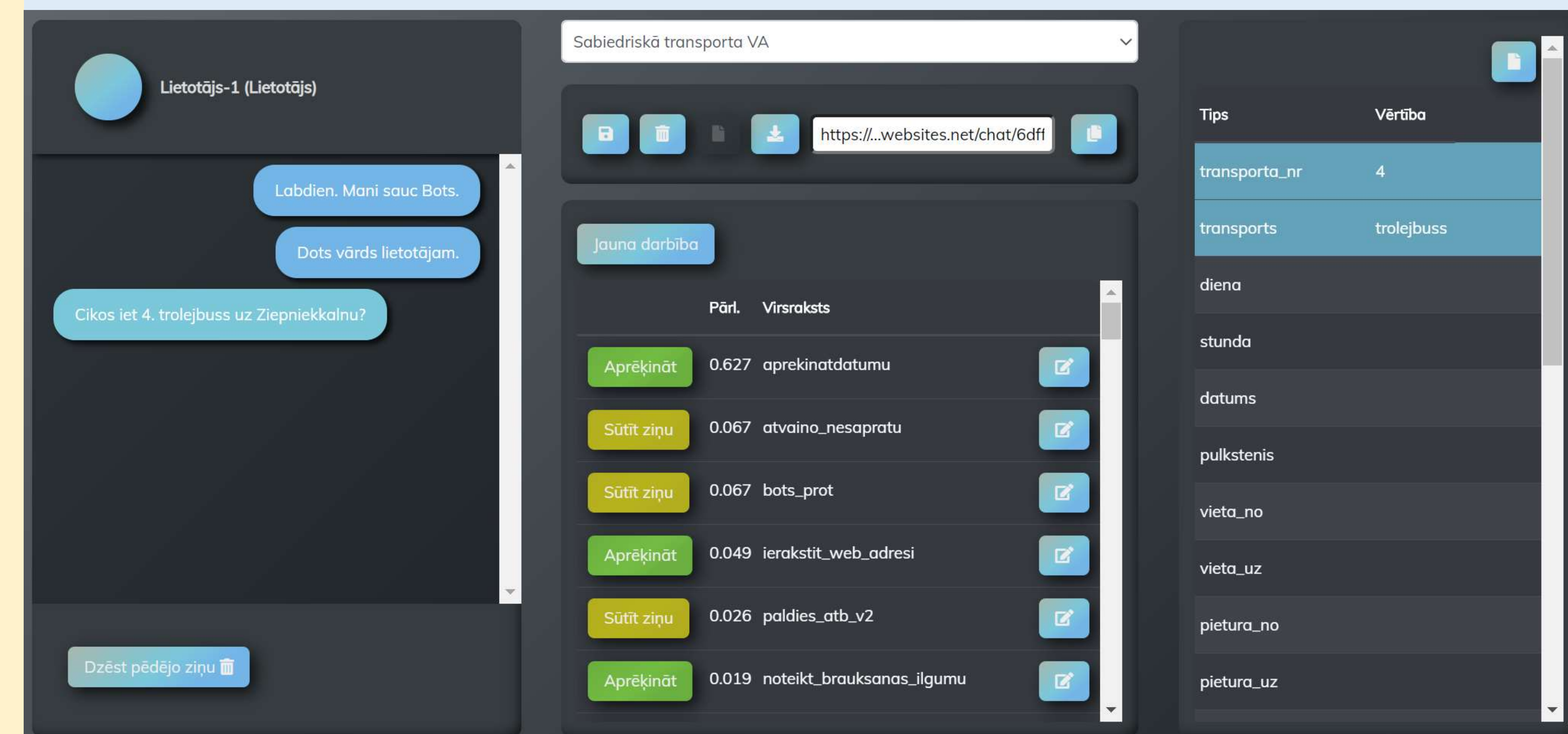
Nr	Vectorization	Dimensions	Entities	Entities set in previous turns	Test accuracy
1	wiki.en.bin	300	194	no	0.8395
2	news.wiki.en.bin	300	194	no	0.8303
3	BERT-Base	768	194	no	0.8209
4	Intents	42	194	no	0.8360
5	wiki.en.bin	300	20	no	0.8191
6	news.wiki.en.bin	300	249	no	0.8291
7	news.wiki.en.bin	300	498	yes	0.8388
8	wiki.en.bin	300	498	yes	<b>0.8398</b>
9	Intents	42	498	yes	0.8443

- 160 Latvian dialogs in transport domain collected using the developed platform.

Nr	Number of dialogs	Average accuracy	Standard deviation
1	33	0.8576	0.0582
2	52	0.8415	0.0469
3	68	0.8536	0.0610
4	82	0.8712	0.0617
5	97	0.8919	0.0351
6	122	0.8492	0.0378
7	128	0.8468	0.0309
8	160	0.8617	<b>0.0231</b>

## Interactive dialog collection environment

- Dialog examples are collected using the **Wizard-of-Oz method**.
- The Next action prediction model populates the list of possible actions depending on conversation history.



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