American Express Challenge 2020

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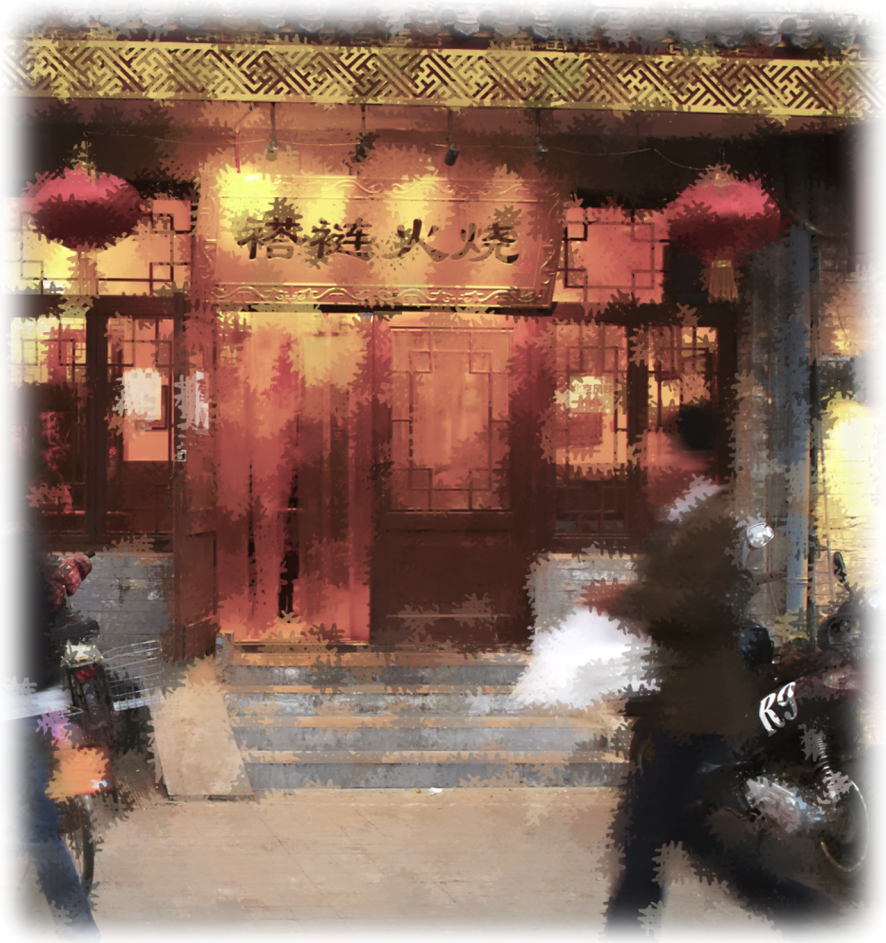
Artificially intelligent
ChatBot
for travel recommendation

Table of Contents



Business insights into the chatbots applied to the travel industry

Common Use Cases of chatbots applied to travel

Bain's Elements of Value

- Saves time
- Informs
- Reduces effort
- Avoids hassles
- Simplifies

Conclusion

- Travel chatbots offer multiple services, from suggesting transportation and places to visit to resolving after-sales queries, thereby creating value for customers.

Chatbots can improve the customer experience at every stage of the travel

CUSTOMER JOURNEY in American Express Travel

Planning travel	Booking flight or hotel	Finding activities, restaurants or pubs	After-sales support
Customer asks for help with travel plan	Customer provides requirements	Customer sends vague queries	Customer makes inquiries
Chatbot provides travel recommendations, tips and information	Chatbot finds the best personalised offers	Chatbot recognizes and uses the trigger words to suggest relevant options	Chatbot resolves simple customer support questions quickly

Conclusion

- Chatbots give relevant suggestions and personalised offers to help customers from planning their travel to booking for flight or hotel and finding local places and activities.
- Chatbots can also provide after-sales support by solving simple inquiries quickly.

What is Bidirectional Encoder Representations from Transformers (BERT)?

Attention mechanism:
Multi-head self-attention mechanism to take into account the context from every other tokens

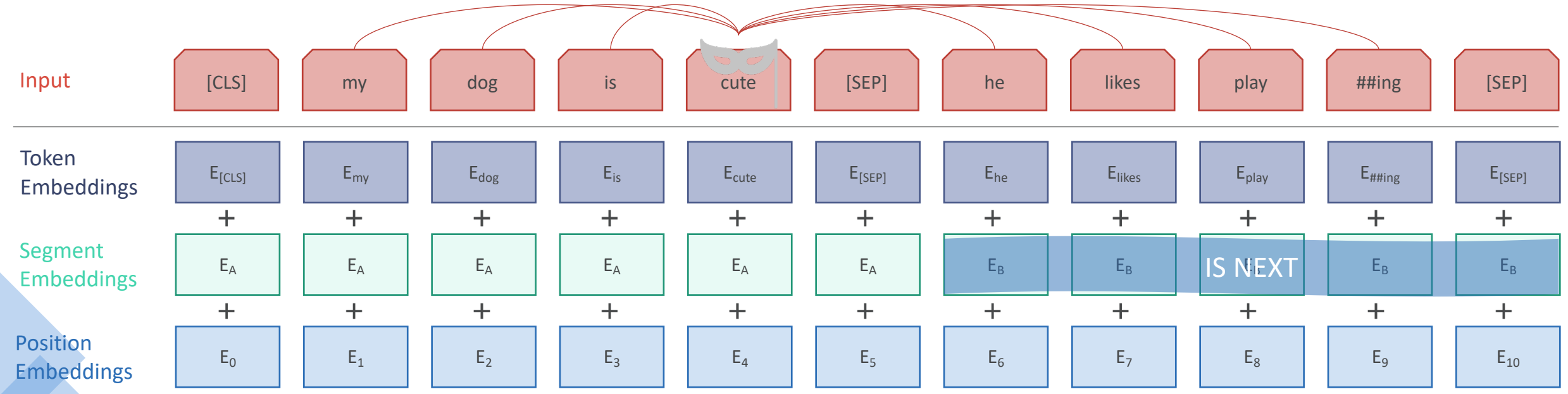
Mask tokens:

- 15% of the tokens are masked for pre-training which makes the model bidirectional
- To improve transferability in a real-world application, the masked token is replaced by [MASK] (80%), a random token (10%) and itself (10%)

IS NEXT

Next Sentence Prediction:

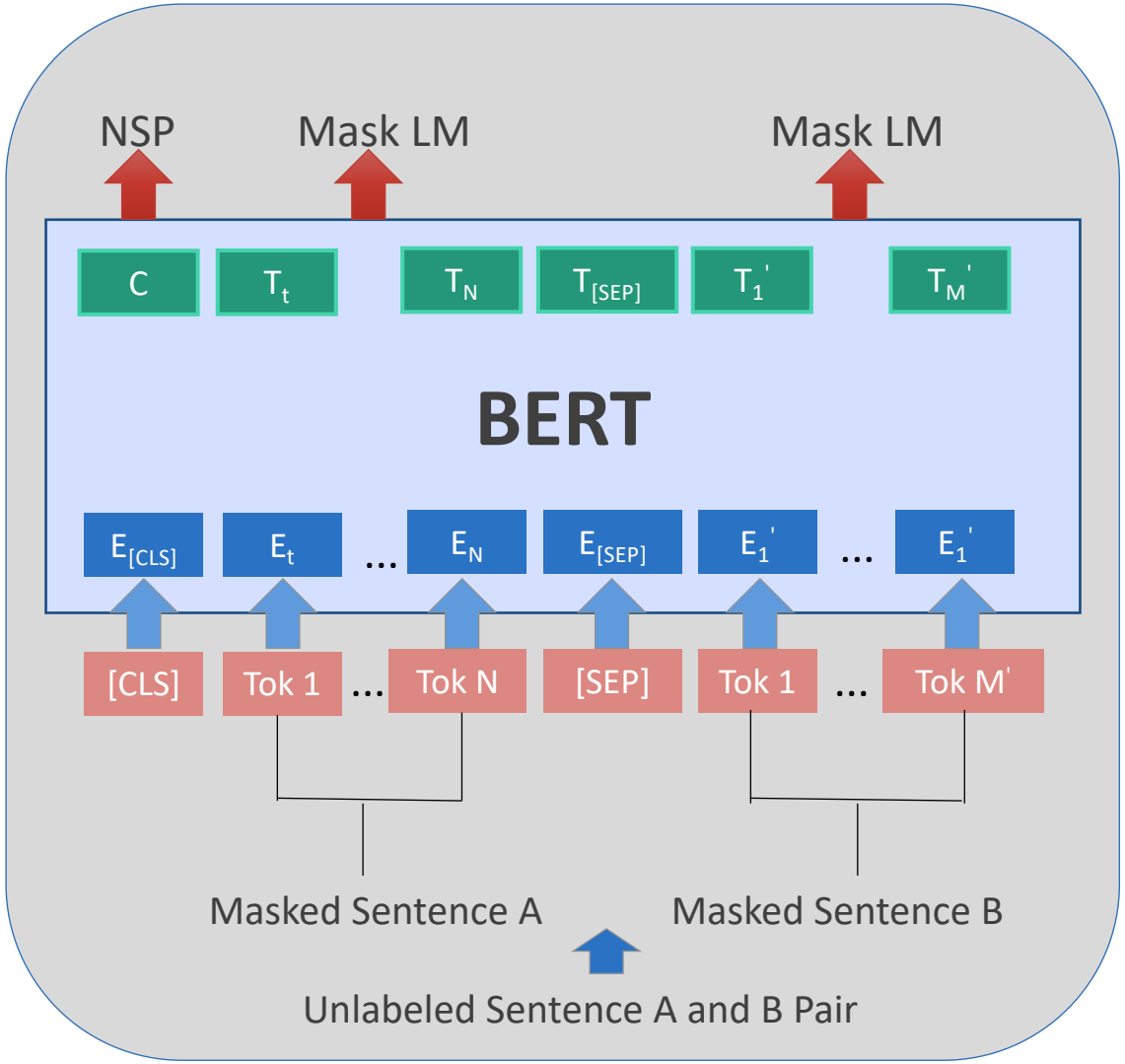
- The sentences used in training are in pair: 50% are related (IS NEXT) 50% are unrelated (NOT NEXT).
- The pre-trained model learns cross-sentence consistency through the next sentence prediction training.



Conclusion

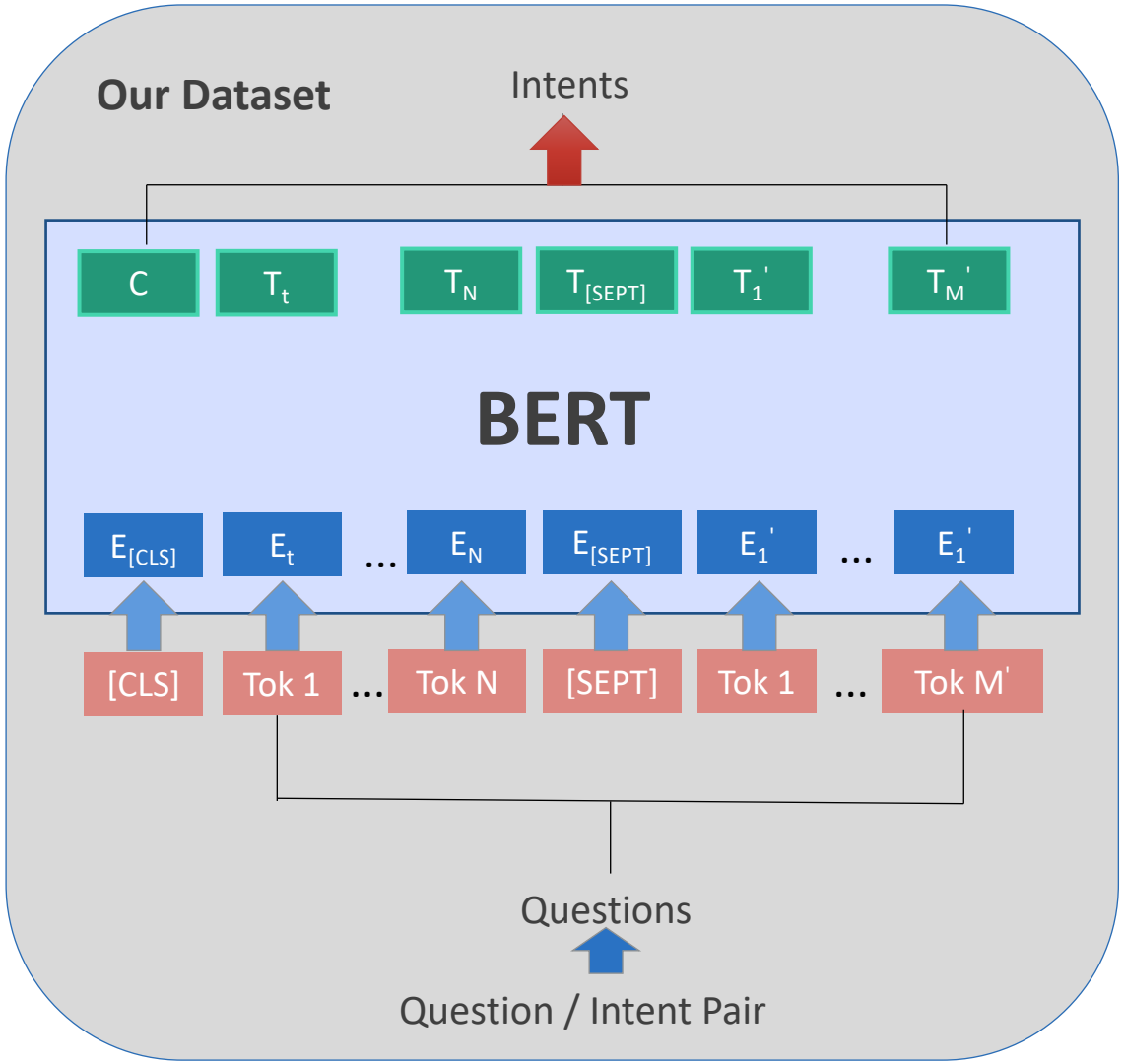
- The Bert model takes into account the meaning, the order of the words and the context thanks to a well-designed coupling of attention mechanism with token masks and next sentence prediction
- Gives state-of-the-art predictions for a wide range of different NLP tasks

Pre-training and fine-tuning process for travellers' intent predictions



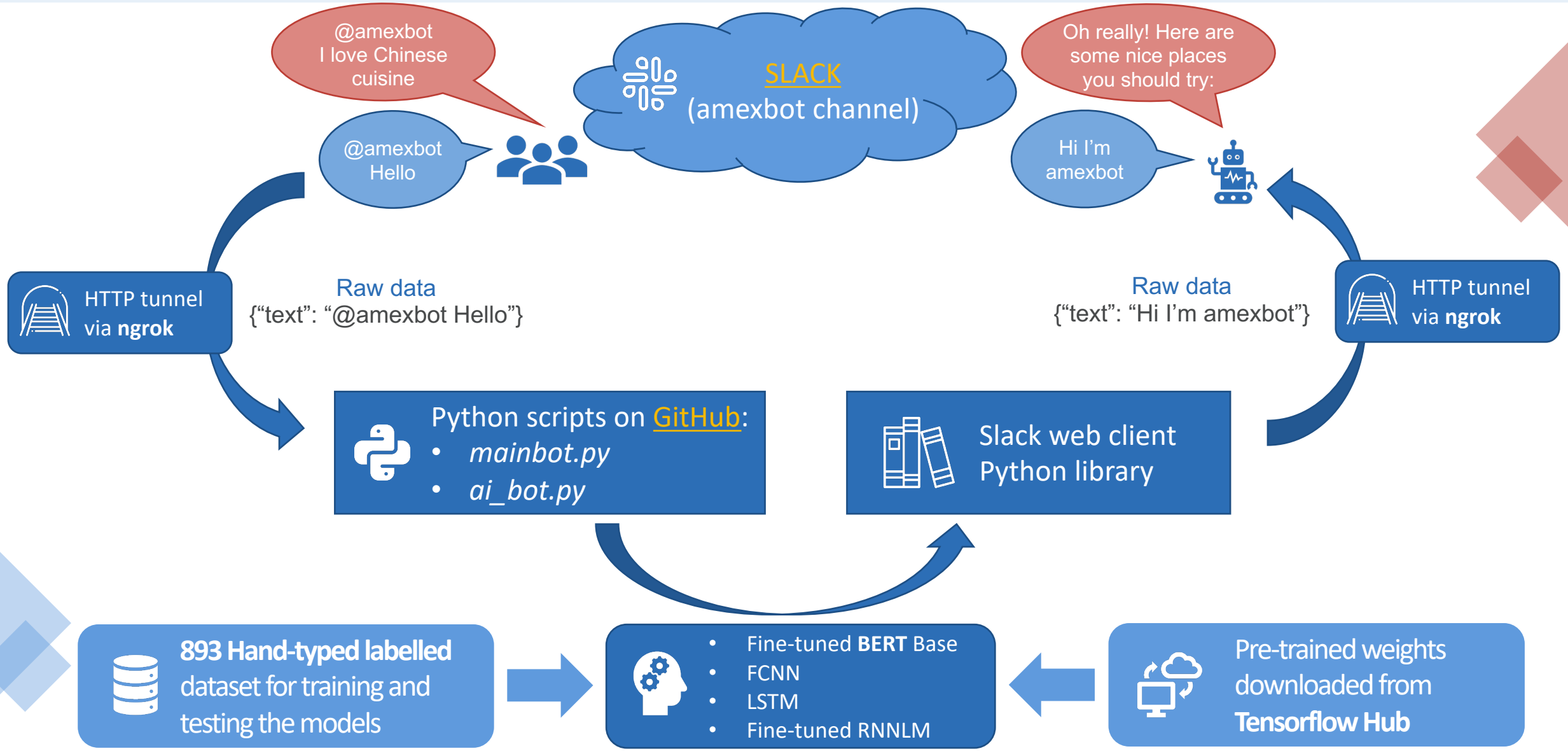
Pre-training

Pre-training and fine-tuning process for travellers' intent predictions



Fine-Tuning

The key components of our chatbot



State-of-the-art models applied to travel recommendation

Project's origins

For the American Express Hackathon Challenge 2020, we proposed an AI-based chatbot solution to help customers make better choices when planning their travel.

Our solution

By using the state-of-the-art deep learning models, we designed an intent prediction chatbot that understands customers' needs and redirects them to the relevant information or human agents.

Results

After training the model on 732 intent-labelled questions, we tested the model using 161 other randomly selected questions. The fine-tuned Bert-base model gave 96.89% accuracy, outperforming the other models we had tested.

Future developments

Expose the chatbot to a mobile app, a web app or a website.

Add more complexity to labelling and diversify data.

Use the real customer datasets to better fit AmEx's needs.

Hackathon Team

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