Artificial Intelligence Software Based On Real Life Example

Introduction

According to the cognitive scientist Marvin Minsky, one of the field's most famous practitioners, AI is " the science of making machines do things that would require intelligence if done by men".

AI software

It is such software that is capable of intelligent behavior. If we want to create this type of intelligent software, this involves simulating a number of capabilities, including reasoning, learning, problem-solving methods, perception, and knowledge representation, etc.

Uber AI: Advancing Mobility with Artificial Intelligence

Artificial intelligence powers many of the technologies and services underpinning Uber's platform, allowing engineering and data science teams to make informed decisions that help improve user experiences for products across their lines of business.

Uber AI powers applications in computer vision, natural language processing, deep learning, advanced optimization methods, and intelligent location and sensor processing across the company, as well as advancing fundamental research and engaging with the broader AI community all over the world through publications and open-source projects.

These machine learning skills and AI techniques and models allow Uber to move the needle across several verticals, from transportation and mobility to customer support and driver-partner navigation process. In this year alone, AI research at Uber has led to significant improvements in demand prediction and more seamless pick-up experiences for both driver and passenger both.

Methodology

Improving location accuracy with sensing end perception

In the previous years, Uber AI's Sensing and Perception team worked on projects across our mobile widely and backend stack to improve the coverage, accuracy, speed, navigation process and directions or heading of vehicle locations on the Uber platform. By overcoming the limitations of GPS and having more precise locations makes it easier for riders and drives to find one another, improves estimated times of arrival (ETAs), reduces rider and driver cancellations, and makes the marketplace operate more efficiently.

Leveraging computer vision to make Uber safer and efficient

The Computer Vision Platform team has worked closely with the product team across Uber to

enable scalable, reliable, and quick validation of driver identity when drivers go online. And, as Uber on boards a growing number of drivers and restaurants to their platform, they've built automated deep learning transcription technology that's suited to Uber's specific use case documents with the blocking of text that need to be output as structured data for downstream processing, rather than a text blob.

Enhancing real-time forecasting with neural networks

Uber leverages ML models powered by neural networks to forecast rider demand, pick-up end drop-off ETAs, and hardware capacity planning requirements, among other variables that drive their operations. To improve their forecasting abilities in 2019 and beyond, they developed new tools and techniques to enhance these models, including X-Ray, GENIE, and HotStarts.

Creating more seamless communication with conversational AI

To facilitate the best end-to-end experience possible for users, Uber is committed to making communication with their customers easier and more accessible. In 2019, they leveraged Uber's conversational AI platform, empowering their support teams to resolve user issues as accurately and quickly as possible. Further, they used this platform to lessen the potential for distracted driving by allowing driver-partners to more seamlessly communicate with riders via hands-free pick-up and one-click chat.

To this end, they also developed and open-sourced the Plato Research Dialogue System, a flexible conversational AI platform for building, training, and deploying conversational AI agents, enabling state-of-the-art research in conversational AI. While currently only used for research purposes, Plato has the potential to be leveraged in production.

In this section, they propose a two-stage transfer learning framework to address their research problem.

Basic idea

In their problem, although tasks are not exactly the same between the source and target domains, each category in the source domain could be seen as a special case of a corresponding category in the target domain — if an unlabeled vehicle moves very similar to taxis, it is probably a ridesharing car; if its mobility pattern is close to buses, it should not undertake ridesharing activities. Then, if a proper feature space shared by their source and target domains is found, they could expect to use the patterns learned from the source domain to classify the unlabeled cars in the target domain.

CoTrans overview

Following the basic idea, we design a two-stage learning framework, CoTrans, to detect ridesharing cars leveraging knowledge transferred from taxi and bike open traces. The figure in below is an overview of CoTrans. The two stages are called as source-target domain linking and target domain co-training, respectively.

Discussion

Next year, Uber AI will continue to innovate, collaborate, and contribute to Uber’s platform services through the application of AI across their business. Whether powering sensing and perception systems that improve their routes or enabling the more accurate forecasting of rider demand in the cities they serve, AI is fundamental to Uber’s growth as a company and its ability to deliver safer and more reliable experiences on their platform.

In the end, they have been in this research through the AI definition, how Uber is using AI, their methodology, etc. This is not the end of using AI in the Uber software, there are more to implement, who knows what AI can do for us in the recent future. Nowadays Artificial Intelligence and technology both are one sides of life that always interest and surprise us with new ideas, topics, innovations, products and so on.