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WiDSTLV

Dr. Orna Amir

Abstract:

Waze processes a large amount of data on commuting patterns and driving behavior. This data is used to help users out-smart traffic on a daily basis and as the foundation of transportation studies in smart cities associated with our Connected Citizens Program.

In this talk I will discuss how we have achieved this goal and how we leverage our data for predictive modeling, a/b testing and analytics insights. The path involves developing a deep understanding of our business needs, creating automated infrastructure for solving repetitive use cases, building machine learning models to answer complex questions, and performing deep dive research projects to better understand navigation behavior. The talk will cover technologies used, tools developed, case studies of ML models in production and research studies.

Bio:

Orna Amir is the head of the Analytics group at Waze. The group leads all analytics efforts at Waze, serving a diverse set of company needs including product development, growth, sales, and user community management. Data analyses, tools and machine learning models built in the team support decision making that has helped grow the Waze business and improve its user's experience.

Prior to joining Waze, Google Orna led the Data Mining team at myThings where her team was responsible for creating the algorithms behind the company's advanced real time bidder. Orna holds a Ph.D. in Applied Mathematics from the University of Arizona and has over 15 years of experience in statistical modeling, machine learning, simulation and optimization in a wide range of applications including medical devices, pharmaceuticals, online advertising and navigation.

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Dr. Efrat Rosenman

Abstract:

We are in the midst of a transportation revolution. Providing personal mobility to anyone, anytime in a safe, reliable and comfortable manner is not a dream. Our vehicles – and how we interact with them – are fundamentally changing. Recent advances in machine-learning and artificial intelligence made self-driving cars possible and this will take mobility to a new phase.

In this talk I will describe the differences between advanced-driver-assistance systems (ADAS) and a fully autonomous vehicle (AV) and the technologies we use to reach cognitive driving capabilities. I will explain the challenges of perception and planning, and discuss some of the innovative technologies we utilize to enable the required performance level. We will discuss the need for massive amounts of data and the use of automatic data annotation.

The second part of the talk will address safety and how we reach a level of safety far beyond the capabilities of humans.

Bio:

Efrat Rosenman joined General-Motors in July 2016 to lead an advance-engineering group with the objective to develop & deploy an Artificial Intelligence-based driving agent for General-Motor's future AV (Autonomous Vehicle) programs.

Prior to joining GM, Efrat spent 16 years with Applied Materials, as head of the Algorithm Department. At Applied she was responsible for the development of inspection and review algorithms for the entire product portfolio and established image-processing as a core competency of the company.

Efrat obtained her Ph.D. in Physical Chemistry from Bar-Ilan university, Israel.

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Dr. Dafna Shahaf

Abstract:

Accelerating Innovation Through Analogy Mining

The availability of large idea repositories (e.g., the U.S. patent database) could significantly accelerate innovation and discovery by providing people with inspiration from solutions to analogous problems. However, finding useful analogies in these large, messy, real-world repositories remains a persistent challenge for either human or automated methods.

In this work we explore the viability and value of learning simpler structural representations which specify the purpose of a product and the mechanisms by which it achieves that purpose. Our approach combines crowdsourcing and recurrent neural networks to extract purpose and mechanism vector representations from product descriptions. We demonstrate that these learned vectors allow us to find analogies with higher precision and recall than traditional information-retrieval methods. In an ideation experiment, analogies retrieved by our models significantly increased people's likelihood of generating creative ideas.

Bio:

Dafna Shahaf is an Assistant Professor in the School of Computer Science and Engineering at the Hebrew University of Jerusalem. Her research is about making sense of massive amounts of data. She designs algorithms that help people connect the dots between pieces of information and turn data into insight. She is especially interested in unlocking the potential of the many digital traces left by human activity to understand and emulate human behavior. Her work has received multiple awards, including Best Research Paper at KDD'17 and KDD'10 and the IJCAI Early Career Award. She received her Ph.D. in Computer Science from Carnegie Mellon University. Prior to joining the Hebrew University, she was a postdoctoral fellow at Microsoft Research and Stanford University.

Dr. Kira Radinsky

Abstract:

Our world faces increasingly complex challenges: we destabilized the climate, haven't beaten all diseases, and haven't spread the values of democracy and freedom to large parts of the globe, where violence and riots reign supreme. The world must be fixed in our generation - everyone would agree. But in order to take action, build a plan, we need to see the complete picture, and empower decision makers with tools to make those changes. This decade, we have finally reached a critical amount of data to facilitate the creation of such tools.

My work is inspired by Mark Twain's quote, who once said: "The past does not repeat itself, but it rhymes." Although future events have unique circumstances, they typically follow familiar past patterns. Over the past few years, I devoted my life to development of prediction techniques. My system inferred that Cholera outbreaks in land-locked areas are more likely to occur following storms, especially when preceded by a long drought. Another inference is that genocide events tend to occur following events where local opinion makers describe minority groups as pests. These types of patterns are composed of several abstractions, over variable-term temporal extents and selected from a large number of possible causes. The algorithms I developed deal with the complexity of discovering such patterns.

Large-scale digital histories, social and real-time media, and human web behavior are harvested and augmented with human knowledge mined from the web to afford real-time estimations of likelihoods of future events. Most recently, these algorithms have accurately predicted the first Cholera outbreak reported in Cuba in fifty years. These types of actionable predictions, that enable preventative measures, have drawn the attention of a UN genocide-prevention organization and the Gates foundations and illustrate the vast potential for real impact on the state of humanity.

In the last few years I have been focusing on applying similar techniques for the healthcare and Pharma, leveraging large amount of data obtained from both medical records, EMR and other medical research results data in a quest to create an AI system for automated medical research and breakthroughs.

Bio:

As the chief scientist and the director of data science of eBay, Dr. Kira Radinsky is building the next generation predictive data mining, deep learning and natural language processing solutions that will transform eCommerce. She co-founded SalesPredict, acquired by eBay in 2016, that was the leader in the field of predictive marketing building solutions leveraging large-scale data mining to predict sales conversions.

One of the up-and-coming voices in the data science community, she is pioneering the field of Web Dynamics and Temporal Information Retrieval.

Dr. Radinsky gained international recognition for her work at Microsoft Research, where she developed predictive algorithms that recognized the early warning signs of globally impactful events, including political riots and disease epidemics. In 2013, she was named tothe MIT Technology Review's 35 Young Innovators Under 35, in 2015 as Forbes 30 under 30 rising stars in enterprise technology, and in 2016 selected as "woman of the year" by Globes. She is a frequent presenter at global tech events, including TEDx, Wired, Strata Data Science, Techcrunch and academic conferences, and she publishes in the Harvard Business Review.

Radinsky also serves as visiting professor at the Technion, Israel's leading science and technology institute, where she focuses on the application of predictive data mining in medicine.