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IRUS Session 2: Advances in Applied Machine Learning and Analytics

Gokul Swamy, Research Scientist with Amazon
Title: Machine Learning for the E-Commerce Sector

Abstract: With the advent of e-commerce it is imperative to be able to analyze the voluminous streams of data in-order to generate insights, understand trends and make recommendations for future course. Machine learning (ML) methodologies have been widely applied to this sector to address a gamut of problems including but not limited to demand forecasting, product recommendation, visual search, targeting, fraud detection, etc. In this talk we outline the scope of these problems and elucidate on some of the learning methodologies that have found application in this space.

Ramakrishna Urs, Principal Technology Architect, Infosys
Title: Machine Learning applied for automated account classifications

Joy Mustafi, Principal Applied Scientist, Data Science and Machine Learning at Microsoft
Title: Applications of Cognitive Computing

Abstract: Cognitive computing makes a new class of problems computable. To respond to the fluid nature of users understanding of their problems, the cognitive computing system offers a synthesis not just of information sources but of influences, contexts, and insights. These systems differ from current computing applications in that they move beyond tabulating and calculating based on pre-configured rules and programs. They can infer and even reason based on broad objectives. In this sense, cognitive computing is a new type of computing with the goal of more accurate models of how the human brain or mind senses, reasons, and responds to stimulus. It is a field of study which studies how to create computers and computer software that are capable of intelligent behavior. This field is interdisciplinary, in which a number of sciences and professions converge, including computer science, electronics, mathematics, statistics, psychology, linguistics, philosophy, neuroscience and biology. They MUST learn as information changes and as goals and requirements evolve. They MUST resolve ambiguity and tolerate unpredictability. They MUST be engineered to feed on dynamic data in real time. They MUST interact easily with users so that those users can define their needs comfortably. They MUST interact with other processors, devices, services, as well as with people. They MUST aid in defining a problem by asking questions or finding additional source input if a problem statement is ambiguous or incomplete. They MUST remember previous interactions in a process and return information that is suitable for the specific application at that point in time. They MUST understand, identify, and extract contextual elements such as meaning, syntax, time, location, appropriate domain, regulation, user profile, process, task and goal. They may draw on multiple sources of information, including both structured and unstructured digital information, as well as sensory inputs (visual, gestural, auditory, or sensor-provided). Students often ever face difficulties while solving complex mathematical word problems – whether arithmetic, combinatorics or mechanics. In project CogniMaths, there are two factors that contribute to the difficulty of a word problem: The first is to harness the power of natural language processing to tackle this problem and extract information from the text. The second factor is realizing, which is the correct formulae to apply to obtain the desired answer. The research solution can be integrated as an interactive learning tool for students and educators around the world to help them achieve more. The solution is a computer-based question-answer system can understand an arithmetic or algebraic math problem stated in natural language and provide an answer or solution in real-time. The core idea consists of the following key steps: Get the input problem statement and question to be answered; Determine whether the original sentences are well-formed from a mathematical perspective; If required, convert the input sentences to a sequence of sentences which are well-formed from a mathematical perspective; Convert the well-formed sentences into mathematical equations; Solve the set of equations using applicable logic or mathematical methods to get a mathematical result; Correlate the mathematical result to the original question to be answered; Narrate the mathematical result in natural language, as an answer to the original question.