Dr. Kiri Wagstaff - Researcher in artificial intelligence and machine learning at the Jet Propulsion Laboratory.

Title: Machine Learning for Space Exploration

Abstract:
Today's spacecraft serve as our robotic explorers. They orbit the Earth, visit other planets, and drive on the surface of Mars. Early spacecraft collected data and sent it back without examining the contents. Today we have developed machine learning and data analysis methods that allow spacecraft to assess the data and its contents prior to transmission, so that the most interesting or valuable observations are sent back first. The Mars Science Laboratory rover is able to autonomously select its own targets for the ChemCam laser spectrometer and collect new data based on its decisions. We are currently developing methods for novelty detection to explore the unknown, like the surface of Europa. These advances are enabled by techniques from probability, statistics, and linear algebra.

Dr. Alexandre Cunha - Director, Center for Advanced Methods in Biological Image Analysis, Computational Scientist, Center for Data-Driven Discovery, California Institute of Technology.

Title: Median Shapes

Abstract:
I will present methods to compute median of shapes which is based on the extension of rectilinear median to higher dimensions. The median finding problem is formulated as an optimization over distances and it is solved directly using the watershed method as an optimizer. Computing the geometric median of shapes is robust in the presence of outliers and it is superior to the mean shape which can easily be affected by the presence of few outliers. The median shape faithfully represents the true central tendency of the data, contaminated (up to a point) or not. The method can be applied to manifold and non manifold shapes, with connected or disconnected components. The application of distance transforms and watershed algorithm, two well established constructs of image processing, lead to an algorithm that can be quickly implemented to generate fast solutions with linear storage requirements. The methods are demonstrated in synthetic and natural shapes, with applications in biology and botany, and median and mean results are compared under increasing contamination by strong outliers.

Dr. Karthik Ramasamy - Machine Learning Engineer, Google

Title: How Tech Companies Use Data Science to Run Their Business

Abstract:
You have probably heard that Data Scientist is the hottest job of the decade. This talk will shed some light on why that is the case. It will cover how companies, specifically modern internet tech giants, use data science to drive their businesses. It will give insights into various job roles

that play critical part in developing complex systems that are driven by math. It will also cover the recent advancements in machine learning and some common algorithms used by such systems. Finally, the more exciting part of the talk will be covering how to prepare yourself for a career in data science and how to approach different roles within that domain and what are the skills you need to learn for that.