Séminaire ICI : Sotiris Skaperas

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Titre du séminaire et orateur

Real-Time Video Content Popularity Detection Algorithms using Change Point Analysis.

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Abstract

Video content is responsible for more than 70% of the global IP traffic. Consequently, it is important for content delivery infrastructures to rapidly detect and respond to changes in content popularity dynamics. To this end, flexible and adaptive load balancing can be used, based on real-time content popularity detection schemes. In this paper, we propose the employment of on-line change point (CP) analysis to implement real-time, autonomous and low-complexity video content popularity detection. Our proposal, denoted as real-time change point detector (RCPD), estimates the existence, the number and the direction of changes on the average number of video visits by combining: (i) off-line and on-line CP detection algorithms; (ii) an improved time-series segmentation heuristic for the reliable detection of multiple CPs; and (iii) two algorithms for the identification of the direction of changes. The proposed detector is validated against synthetic data, as well as a large database of real youtube video visits. It is demonstrated that the RCPD can accurately identify changes in content popularity and the direction of change. In particular, the success rate of the RCPD over synthetic data, is shown to exceed 94% for medium and large changes in content popularity. Additionally, the dynamic time warping distance between the actual and the estimated changes, has been found to range between 20 samples on average, over synthetic data, to 52 samples, in real data. The rapid responsiveness of the RCPD is instrumental in the deployment of real-time, lightweight load balancing solutions, as shown in a real example.

Bio

Mr Sotiris Skaperas pursues his PhD in the area of resource management in 5G networks at the University of Macedonia, Thessaloniki, Greece, under the supervision of Dr Lefteris Mamatas and Dr Arsenia Chorti (ENSEA), since January 2017. He received his MSc degree in statistics and modeling (1st class) from the Department of Mathematics, Aristotle University of Thessaloniki Greece in 2016 and also holds a BSc from the same Department. He]works in the areas of resource allocation/load balancing for 5G networks

using time-series/change point analysis and stochastic modelling.

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