Enhancing Students' Learning Experience with a Dash-Based Multimedia Delivery System

Mohammed Amine Togou, Ting Bi and Gabriel-Miro Muntean

Performance and Engineering Laboratory (PEL)

Dublin City University

{mohammedamine.togou, ting.bi, gabriel.muntean}@dcu.ie

As the eLearning market is developing at an uncommon rate, there has been a high demand for rich media-based services (e.g. multimedia and multi-sensorial) from academic and corporate institutions. This has put pressure on the current delivery networks as the volume of data carried has significantly increased (i.e., high quality content requiring high bandwidth), causing high loss and extremely variable delays, which eventually affect the end-users' perceived learning experience. Extensive research has been carried out to design innovative solutions that can ensure the delivery of high quality multimedia data over best-effort networks, considering the network delivery conditions. Adaptive delivery solutions are the most successful as they adjust the bandwidth used by the adaptive applications via dynamically increasing or decreasing the content transmission rate.

In order to improve users' perceived learning experience when multimedia and mulsemedia educational content is delivered in eLearning environments, the EU Horizon 2020 NEWTON Project employs a DASH-based adaptive solution for the delivery of multimedia content. This involves monitoring and adjusting content based on the combined effect of dynamic variation of network conditions, user device characteristics and user profile. In addition, it deploys a multi-sensorial content adaptation solution that incorporates alternative media (e.g. olfaction, haptic and wind) in their presentation based on users' preferences indicated in their profile.