

Evolutionary Game Based Access Class Barring for Machine-to-Machine Communications

Tingsong Jiang *, Xu Tan *, Xi Luan *, Xiaoning Zhang*, Jianjun Wu*

* *Institution of Advanced Communications, EECS, Peking University, Beijing, China*

tingsongpku@gmail.com, just@pku.edu.cn

Abstract—Machine-to-machine (M2M) communication faces the most critical challenge that when a massive number of MTC devices perform random access, there will be severe congestions. 3GPP developed a network coordinated random access stabilization scheme known as the access class barring(ACB) to deal with the problem in LTE-Advanced. However, MTC devices in overlapped areas still suffer severe access delays due to the noncooperation and individual setting of ACB factor among BSs. We propose evolutionary game based ACB algorithm to help MTC devices alleviate congestions and thus eliminate substantial defects in the ordinary ACB. Finally, the performance of the evolutionary game based ACB algorithm is analysed, and simulation results show the convergence and effectiveness of the proposed algorithm.

Keyword—Evolutionary Game, Access Class Barring (ACB), M2M communications, Radom Access



Tingsong Jiang received the bachelor degree in electronic information science and technology from Peking University, Beijing, P.R.China, in 2010. He has been an postgraduate student in Institution of Advanced Communications, Peking University, China. His research interests are in the area of physical layer in satellite mobile communications, M2M communications, energy efficiency.



Jianjun Wu received his B.S., M.S. and Ph.D. degree from Peking University, Beijing, P.R.China, in 1989, 1992 and 2006, respectively. Since 1992, he has joined the School of Electronics Engineering and Computer Science, Peking University, and has been appointed as an associate professor since 2002. His research interests are in the areas of satellite communications, wireless communications, and communications signal processing.