

# Modeling & Simulation from Theory to Practice: New Advances and Potential Developments

Erdal Cayirci

NATO Joint Warfare Center / University of Stavanger

Stavanger, Norway

erdal.cayirci@uis.no

## ABSTRACT

Computer simulation has attracted many researchers for several decades and been applied in many fields. Military is among the earliest application area for computer simulation. Especially virtual simulators are part of almost every military individual or collective training system. Military constructive simulations are also among the critical tools for military. Although military computer simulations have matured enough, there are still considerable gaps between the requirements and available tools. Advances in the field and potential developments will likely fill these gaps soon. However, the requirements are like moving targets, and there will always be some new requirements to be fulfilled. In this talk, we will explain the challenges that the industry faced when applying computer simulation technology to military requirements. We will also elaborate on the potential gaps and future developments.



**Erdal Cayirci** graduated from Army Academy in 1986 and from Royal Military Academy, Sandhurst in 1989. He received his MS degree from Middle East Technical University, and a PhD from Bogazici University both in computer engineering in 1995 and 2000, respectively. He retired from the Army when he was a colonel in 2005. He was an Associate Professor at Istanbul Technical University, Yeditepe University and Naval Sciences and Engineering Institute between 2001 and 2005. Also in 2001, he was a visiting researcher for the Broadband and Wireless Networking Laboratory and a visiting lecturer at the School of Electrical and Computer Engineering, Georgia Institute of Technology. He is currently

Head, CAX Support Branch in NATO's Joint Warfare Center in Stavanger, Norway, and also a professor in the Electrical Engineering and Computer Science Department of University of Stavanger. His research interests include cloud computing, simulation and mobile communications.

Professor Cayirci has acted as an editor of the journals IEEE Transactions on Mobile Computing, AdHoc Networks (Elsevier Science) and ACM/Kluwer Wireless Networks, and has guest edited four special issues of Computer Networks (Elsevier Science), AdHoc Networks (Elsevier Science) and Kluwer Journal on Special Topics in Mobile Networking and Applications (MONET).

He received the “**2002 IEEE Communications Society Best Tutorial Paper**” Award for his paper titled “A Survey on Sensor Networks” published in the IEEE Communications Magazine in August 2002, the “**Fikri Gayret**” Award from Turkish Chief of General Staff in 2003, the “**Innovation of the Year**” Award from Turkish Navy in 2005 and the “**Excellence**” Award in ITEC 2006.

He co-authored two books titled as “Security in Wireless Ad Hoc and Sensor Networks,” and “Computer Assisted Exercises and Training: A Reference Guide” both published by John Wiley & Sons in 2009.