

A LIFE IN SIMULATION IN THE SERVICE TO SOCIETY, PAST AND PRESENT – DOES SIMULATION HAVE A FUTURE?

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ABSTRACT

Join Chick Macal for a keynote journey through simulation’s past, present, reflecting on its societal impact and asking the provocative question: Does simulation have a future in the Age of AI?

Chick’s career has been a journey through the evolution of simulation, from the early days of digital computing to today’s advances in agent-based modeling, digital twins, and AI. Over more than five decades, he has witnessed simulation grow from its foundations in discrete-event models and system dynamics into a vital discipline for science, engineering, and decision-making. Chick’s focus has been applying simulation to problems of societal importance—public health, energy, and critical infrastructure.

In this Titans talk, he will reflect on milestones and influences that shaped both his career and the broader field, while also looking ahead. Will simulation remain central in an era dominated by AI? Can we inspire new generations to carry the field forward? Chick will argue that simulation’s future depends on how we innovate, integrate with emerging technologies, and continue to demonstrate its indispensable role in service to society.

SPEAKER BIOGRAPHY

CHARLES M. MACAL received an MSc in Industrial Engineering from Purdue in 1975 studying under A. Alan B. Pritsker, and was drawn into simulation during its earliest beginnings. At the time simulation was the “next big thing,” with (1) simulation applications that would save the world (System Dynamics, from the Club of Rome), (2) new simulation languages (GASP IV, Q-GERT, SLAM) that would facilitate the easy and quick simulation model development, and (3) the establishment of companies dedicated to simulation (Pritsker & Associates). Subsequently, he took a position at Argonne National Laboratory with the intent of using simulation modeling to solve the “Energy Crisis,” described by then-President Jimmy Carter as the “moral equivalent of war” (still working on that). While working, he received a PhD in Industrial Engineering & Management Science from Northwestern University, focusing on systems of optimization models applied to energy markets, and later realized that the same model form is equivalent to what has become known as agent-based modeling. He has received numerous awards for his work on simulation methods, theory, and applications, and served as President or Chairman for most simulation professional organizations, including WSC and SCS. He is Co-Editor-in-Chief of the Journal of Simulation. Chick remains at Argonne developing novel, large-scale applications of simulation to important national and global problems in the areas of energy, infrastructure, energy and critical material supply chains, and other areas. His email address is macal@anl.gov.