



Ciclo de Coloquios 2016

Charla técnica



El Departamento de Informática de la Universidad Técnica Federico Santa María tiene el agrado de invitar a la comunidad Universitaria a su ciclo de coloquios. Esta presentación se realizará en el Auditorio Principal, Edificio A, de la Casa Central el día **Lunes 5 de Diciembre a las 16:00**.

Título

The Lattice Boltzmann Method and its Applications

Expositor



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Mini Bio

Dr. Ayala is currently serving as Assistant Professor of Mechanical Engineering Technology Department in the College of Engineering and Technology at Old Dominion University in Virginia (USA). Prior to joining ODU in 2013, Dr. Ayala spent three years as a Postdoctoral Researcher at University of Delaware (USA). Before that, he held a faculty position at Universidad de Oriente (Venezuela) at its Mechanical Engineering Department. Dr. Ayala received his BS in Mechanical Engineering with honors (Cum Laude) from Universidad de Oriente (Venezuela) in 1995, MS in Mechanical Engineering in 2001 and PhD in Mechanical Engineering in 2005, both from University of Delaware (USA).

He has been interested in research areas such as multiphase flows, turbulent flows, transport of particles in fluid flows, compressible flows, heat transfer, numerical modeling, and high performance parallel computing and scientific computation; using numerical techniques such as the one discussed in this talk. He has published 30 journal papers and dozens of peer-reviewed conferences papers. Over the past 6 years Dr. Ayala has had an average citation per year of all his published work of over 30.

Concurrently, Dr. Ayala has worked for a number of consulting companies where has been directly involved in more than 20 different engineering projects. He is also trained to use some well-known commercial software to model industrial problems involving fluid flow. With that, he has identified and assisted in the execution of a number of process improvements to a number of industries. In addition, since 2008 he has been a member of the Committee of Spanish Translation of ASME Codes and his is currently the Chair of the ASME Subcommittee on Piping and Pipelines in Spanish.

Resumen

The Lattice Boltzmann Method (LBM) is a relatively new scheme that has gained exponential popularity in the past 15 years. Originally created to model fluid mechanics, it was inspired from the Lattice Gas Automata method. LBM has evolved far past its original purpose and is being used to simulate many other scientific problems. In LBM a known amount of pseudo-particles are used to simulate the collision and movement of particles in a system with a fluid in motion. Each pseudo-particle represents a varying amount of actual particles in the system that collides with other pseudo-particles at a known velocity at prescribed locations. At each collision one calculation is done for every possible direction the actual particles could go, the amount of directions are set to be known and controlled resulting in more efficient use of power and resources.

In this talk, I will provide insights on the history of the LBM, describe in more detail how the method works, mention its advantages and limitations and compare it against other CFD methods, talk about the current LBM development areas, and briefly prove why the method accurately solve different phenomena. I will also discuss different research areas I have been involved with using LBM, including the joint work with Dr. Torres and his graduate student Mr. Álvaro Salinas (both from Departamento de Informática - UTFSM) to study shallow waters and tsunami propagation waves on open ocean.

Lugar y Fecha

5 de Diciembre de 2016, 16:00
Auditorio Principal, Edificio A,
Valparaíso, UTFSM.

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