Ciclo de Charlas en Ingeniería Mecánica

El Programa de Magister en Ciencias de la Ingeniería Mecánica invita cordialmente a la comunidad universitaria a la charla:

Titulo

Learning aerodynamic tricks from nature with immersed boundary CFD on GPUs.

Expone

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Resumen

This talk is made of three parts (isn't everything?). Our interest in the peculiar aerodynamics of animal fliers is effusive: we can't get enough of unsteady flow physics, vortex wakes and enhanced lift. We'll share some of this first (with a taste of our work on flying snakes!). As computational scientists, we delight in the idea of using simulations to learn the aerodynamic tricks of nature. But this means we have to do unsteady, moving-boundary CFD.We have to tell you how we do this: immersed-boundary methods on GPUs will be our second topic. Like so much of computational mechanics, solving Navier-Stokes equations on GPUs gets us in a pickle: we end up with a sparse linear system, and a bandwidth-bound, low-performing algorithm. We don't know how to resolve this predicament. Nobody does! But some brave new research is brewing. We will see that strides are being made by avoiding communication. That is what modern computers demand of us: find ways to write our algorithms more cleverly to avoid moving data around. We'll take a peek at where that research is going in the final part of the talk

Fecha

Lunes 3 de Agosto, 11:00 hrs, Auditorio C-259, Casa Central.

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