

Yearly Team Meeting ~~2011~~
2012

Xavier Besson

Outline

- 1 What I did?
- 2 What I do?
- 3 Other interests

What I did?

PhD in Computer Science

- Laboratoire d'Informatique de Grenoble (LIG) – Grenoble University
- **Fault Tolerance** and **Dynamic Reconfiguration** for large scale distributed applications
- Supervised by Thierry Gautier and Denis Trystram

1-year Postdoc in US

- Network Based Computing Lab – Ohio State University
- MVAPICH2 team (ie MPI over InfiniBand)
- Supervised by DK Panda

What I do?

Postdoc researcher here since 1 year

DPM-HPC: DPM software with HPC

- eXtended Discrete Element Method (XDEM)
- High Performance Computing (HPC)
- <http://www.xdem.de>

2 Teams:

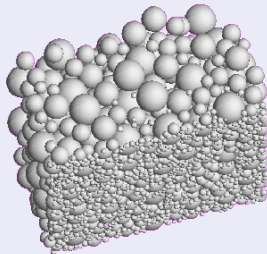
- **Computer Science:** Teambouvry with Pascal Bouvry
- **Process Engineering:** XDEM Team with Bernhard Peters

What is DPM and XDEM?

DPM software is **multi-physics simulation** toolbox modeling granular materials and processes

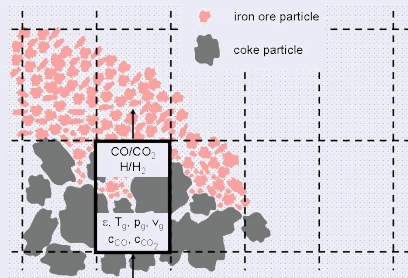
Particle Motion

Snow, Sand, ...

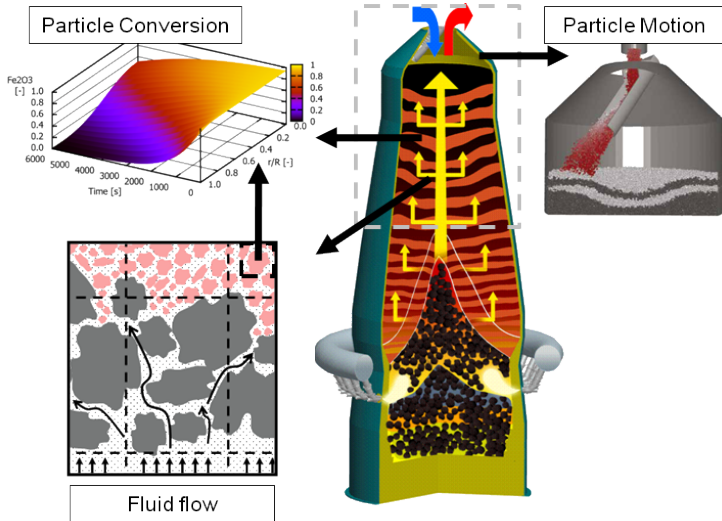


Chemical Reactions

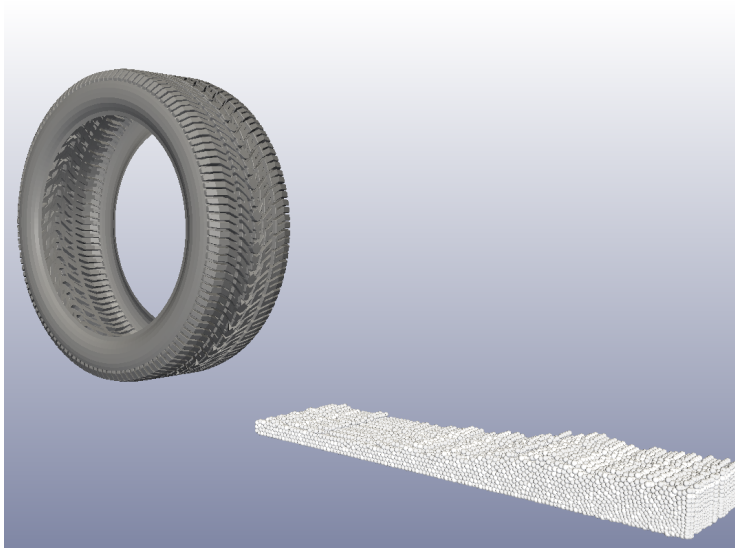
Coke, Iron ore, Biomass, ...



Example: Blast Furnace



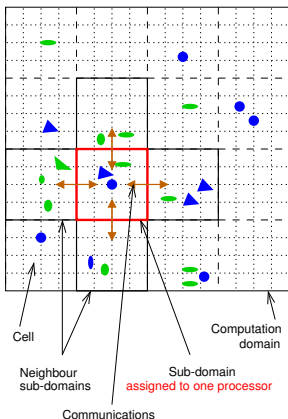
Example: Tire on Snow



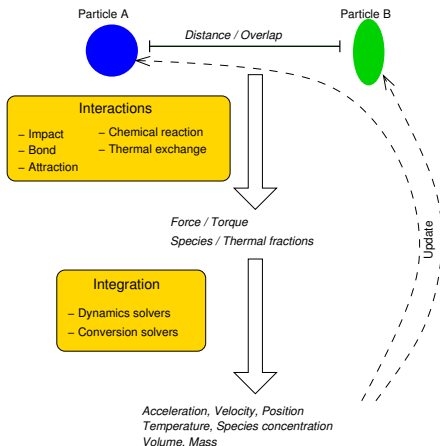
What I really do

- Domain decomposition for parallel/distributed execution
- Unified design for coupled parallel simulations

Parallelism based on
Domain Decomposition (eg ORB)



Unified Design for Coupled Simulation



Other interests, ie how we can work together

Parallel and Distributed Programming

- Programming Models: data-flow, message passing, ...
- Design of parallel/distributed applications
- Distributed algorithms (distributed coordination, reconfiguration, ...)

Fault tolerance for HPC and distributed systems

- Checkpoint/Restart, Message logging, Live migration
- Cheating-fault detection and correction

Large scale experimentation

...