Amol Thakre

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Modelling, Simulation and Statistical Data Analytics for O&G (15+ yrs.)

Senior Staff Analytics Engineer (2013 till date), at GE Global Research Centre, Bangalore

- **Multi-well** optimization for oil field (fluid property modelling).
- **Bioreactor** Modeling and design optimization.
- Production allocation analytics for oil fields and flow assurance digital twin development.
- **CFD Modeling** of flow transitions (bubbly-annular, annular-slug) in oil-gas flow lines.
- Slug mitigation and slug catcher **design optimization strategy**, CFD and reduced order modeling.
- **Aerodynamics** of supersonic cascade design for turbines.
- **Systems modeling** with nodal analysis and multi-well optimization for oil and gas production.
- Led a multiphase umbrella project for future technology roadmap.

Senior Research Scientist (2009-2013), at Statoil ASA, Norway

- Subsea separation and flow assurance expert.
- Led a project on back-production of polymers and its effect on topside processes.
- New and innovative methods of transporting and separating heavy oil (viscous oil).
- New advance **CFD model** for separation of multiphase flow in subsea conditions.
- Planning, execution and analysis of heavy oil rig experiments and proposed recommendation for oil field design.
- Supervised interns and master students.

Research Scientist SINTEF (2009), Norway

- Modeling multiphase flow and separator design.

Research Scientist NOFIMA (2008-2009), Norway

- **"**Development and validation of new food processing techniques and understanding the related food safety issues".
- Modeling and Simulation of "Microwave and radio frequency heating".
- Modeling of a novel super-chilling process in frozen food products.

Junior Scientist, FOM/University Of Twente, Netherlands (2003-2008)

- "Algorithm for Complexity analysis of Images" at **MIT** (USA)
- "Prediction of Boston weather using statistical analysis of past weather data" at **MIT** (USA)
- "Parallelization of molecular dynamics algorithm using MPI" at UT (NL)

Leadership and Project Management Experience (10+ yrs)

- Led multiphase umbrella project for technology strategy in oil and gas industry (GE).
- Led technological road map for qualification of polymers for enhanced oil recovery (Statoil).
- Heavy oil separation and separator design studies (Statoil).
- Phase separation in complex liquids (Twente).

Professional leadership training

- **Executive course on "Leading digital business transformation and innovation" (ISB, 2018-19)**
- **Leadership development course** (GE, 2015)
- **Project management at GE** (GE, 2015)
- Building essential leadership skills (GE, 2014)
- Six Sigma training (GE, 2014)
- Complex Physical, Biological and Social Systems. (**MIT**, Cambridge, 2006)
- Networks, Modeling and Evolution. (**MIT**, Cambridge, 2006)
- Goal oriented working and planning (Utrecht, NL, 2005).

Academics and Research experience (PhD+ 7yrs)

Visiting scientist, University of Twente, Netherlands (2008)
PhD Scholar, University of Twente, Netherlands (2003-2008)

- Simulation of phase separation in simple and complex liquids (**Statistical Physics)**
- Working classes on statistical thermodynamics for master's students.

MS Project: Modeling of phase inversion in liquid-liquid (water/oil) dispersions at IISc (India).
Bachelor of Engineering, Madhav Institute of Technology and Science **(**2000**)**

Presentations and Publications

- **Invited lecture** at HiPC conference on Modeling and simulation challenges in multiphase flow. Goa (2014)
- A **CFD Methodology** for multiphase flow in pipelines, MCAT conference at GE 2014.
- Heat penetration in multiphase liquids and effect of controlled shaking (Submitted to J. of food science)
- Domain formation and growth in spinodal decomposition of a binary fluid by MD simulations **(Physical Review E 77, 011503 (2008))**
- MD simulation of phase separating binary liquids in cylindrical couette cell flow. (**Journal of Chemical Physics 128 (15) 154707 (2008))**
- Spinodal decomposition of asymmetric binary fluids in a micro-Couette geometry. **(Journal of Chemical Physics 129, 074505 (2008))**
- Finite system size effects in the interfacial dynamics of binary liquid films. (**Journal of Chemical Physics 129 (3) 044701 (2008))**
- Presented paper in Juelich Soft Matter Days 2006 on phase separation in complex liquids.
- Presented poster at CCP5 annual meeting in 2006 at Bradford on "Molecular dynamics simulation of liquid-liquid phase separation in binary liquids".
- Presented poster at Juelich Soft Matter Days 2005 on "Simulation of viscoelastic phase separation".
- Presented poster in Utrecth Liquid matter conference 2004 on DPD simulations of phase separation in binary liquids.
- Presented paper in Symposium on "Complex Fluid" at IISc, Bangalore (India) in 2002 on:
- "Phase inversion in liquid-liquid dispersions"

Scholastic Accomplishments

- National merit scholar at higher secondary school.
- Among top 10 % students in Bachelors and Masters of Engineering.
- One of the top seven students chosen for MS (Research) program at prestigious Indian Institute of Science (In top 0.1% of total student appeared)

Computer, Tools and Methods Awareness

Operating systems: Unix (Excellent), Linux (Excellent), Windows (Excellent), Mac(Excellent)
Computer languages: Fortran (Excellent), C (Excellent), C++ (Excellent), Python (Basic)
Software tools: **R**, **Matlab** (Excellent), Mathematica (Good), Maple (Excellent), **Ansys Fluent** (Excellent), Comsol (Excellent), Aspen (Basic), Excel (Excellent)
Computational methods: Molecular Dynamics, Dissipative Particle Dynamics, Monte Carlo, Population Balances, Finite Volume, Finite Element, Lattice Boltzmann

Instruments and Devices

Model separation rigs (Heavy oil rig, Emulsion rig, High temperature and pressure rig)
GPC, HPLC, Spectroscope, Thermocouples, Bioreactors, Heat exchangers, Retorts (Shaka and rotary)

Advance Technical Courses (PhD level)

- **Analytics Edge** (**MIT**, 2016, top 1% of the class)
- Mesh morphing and **design optimization** using Ansys, Bangalore (2015)
- Advance Multiphase flow simulations with Ansys fluent, Oslo (2010,2011**)**
- Introduction to Comsol multi-physics simulations (2008, Oslo)
- Advance course in multi-physics simulations using Comsol (2009, Stockholm)
- Winter school on Modeling, Computing and Simulation in Engineering. (2006, IIT, Madras)
- Workshop on "Soft interfaces with hydrodynamic interactions" at Amsterdam 2005.
- Han-sur-Lesse winter school on Physical Chemistry 2004 and 2005.
- NIC winter school on "Computational Soft Matter: From Synthetic Polymers to Proteins" at Bonn 2004.
- Micro-chemical systems-Principles and applications at NL 2004.
- Computational methods in finance, (2007, University of Twente, NL)
- Interest rates and credit derivatives, (2007, University of Twente, NL)
- Winter school on mathematical finance (University of Amsterdam, NL)
- Celebrating derivatives (2006, Amsterdam, NL)
- Equity valuation (School of Management, 2005 IIT Kharagpur, India)

Professional Memberships and Affiliations

- Institute for thermal processing specialists, USA.
- New England complex system institute, Boston, USA.
- Chemical Engineers Association India.
- JMB centre for fluid dynamics, Netherlands
- Biomedical Institute, IMPACT, University of Twente, Netherlands

Extra Curricular Activities

- Worked as a **freelance journalist** for university's weekly newspaper "UT-Nieuws" for 2.5 years.
- Volunteered as **event organizer** for "**Aadhaar**" for two years, a charity organization for supporting underprivileged in India.
- Taught **Hindi** at ROC, Twente to non-native speakers for six months.
- Alumni member of International Student Advisory Board at University of Twente, Netherlands.
- A Member of **Red Cross**, **Stavanger** Norway.