

Yuanqing Wu

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Education

King Abdullah University of Science and Technology, Thuwal, KSA

PhD in Applied Mathematics and Computational Science, Dec 2015

Track: Computational Geosciences

Dissertation Title: Parallel Reservoir Simulations with Sparse Grid Techniques and Applications to Wormhole Propagation

Supervisor Name: Professor Shuyu Sun

Peking University, Beijing, China

M.Sc. in Software Engineering, July 2008, GPA 3.4/4.0

Thesis Title: The Design and Realization of Balance of Server Load in A Big Scale Distributed Virtual Platform

Supervisor Name: Professor Guoping Wang

University of Science and Technology of China, Hefei, China

B.Sc. in Statistics and Finance & B.Eng. in Computer Science, July 2005, GPA 3.3/4.0

Research and Teaching Interests

Research on reservoir simulation, mathematics, finance, computer science, high performance computing etc.

Research Experience

2011.10-present King Abdullah University of Science and Technology, Thuwal, KSA

Reservoir Simulation and Wormhole Problem Study

Design and realize the 3D parallel two-phase compositional flow model in reservoir simulations. Integrate sparse grid techniques to the model and speedup the simulation program. Design and realize the 3D parallel wormhole model in the hydrocarbon reservoirs. All the codes are written in FORTRAN90, MPI and MATLAB by myself. The codes have been tested on Shaheen, Nesper, Linux and Mac and achieved excellent scalabilities. The size of the domains can be as large as more than millions of cells and thousands of cores are used.

2013-2014 Technical University Munich, Munich, Germany

The Application of Sparse Grids to Speeding up Flash Calculations

Flash calculation is a performance bottleneck in the two-phase compositional flow simulations. Sparse grids avoid the true procedure of flash calculations and use the estimation way to get the output of flash calculations with the endurable error. I apply the sparse grid algorithm to the reservoir simulation procedure and remove the flash calculation bottleneck.

2006.9-2008.5 Peking University, Beijing, China

A Research to a Big Scale, Distributed and Virtual Realization Platform

The aim of the project is to develop a big scale, distributed and virtual realization platform that could let a number of users and a big scale scene to visit at the same time without collision. The platform could meet the need of all kinds of users and has the functions of editing and scene labeling. The development environment is VC.NET2005. My job is to analyze the visiting mechanism at the server end when a lot of visitors arrive. Realize the servers' equilibrium mechanism.

Work Experience

2009.9 – 2010.8 Hong Kong University of Science and Technology, Hong Kong

Research Assistant & Teaching Assistant

Courses: Java Programming, Design and Analysis of Computer Architectures

2008.6 – 2009.5 Moody's Analytics, Shenzhen, China

Software Engineer

RiskAnalyst is a platform that Moody's KMV has developed for the sake of dealing with financial data. It has integrated many relative components. What I have done is to integrate the CMM module to the system. CMM is just another product of Moody's KMV which stands for Commercial Metrics. I use web methods to get data from CMM and put them into RA. The technologies needed in the project are .net and C#. At the same time, I was responsible for designing and realizing the page of the project with ASP.

2007 Fall Peking University, Beijing, China

Teaching Assistant

Course: Advanced Operation System

Publications

Y. Wu, C. Kowitz, S. Sun, A. Salama, Speeding Up the Flash Calculations in Two-phase Compositional Flow Simulations -- The Application of Sparse Grids, Journal of Computational Physics, 285 (2015) 88-99. (IF: 2.434, SJR: 2.039)

Y. Wu, A. Salama, S. Sun, Parallel Simulation of Wormhole Propagation with the Darcy-Brinkman-Forchheimer Framework, Computers and Geotechnics, 69 (2015) 564-577. (IF: 1.632, SJR: 2.158)

J. Kou, S. Sun, **Y. Wu**, Mixed Finite Element-based Fully Conservative Methods for Simulating Wormhole Propagation, *Computer Methods in Applied Mechanics and Engineering*, 298 (2016) 279-302. (IF: 2.959, SJR: 2.366)

Y. Wu, S. Sun, A. Salama, Parallelization of Two-phase Compositional Flow Simulations: Combination of Sparse Grids and State of the Art Solvers, minor revision required by *Computational Geosciences*.

Y. Wu, S. Sun, The Study of Equivalence of Two Models in Single-phase Multicomponent Flow Simulations, under review by *Computers & Mathematics with Applications*.

Y. Wu, S. Sun, 3D Parallel Simulation of Matrix Acidization with the Darcy-Brinkman-Forchheimer Framework and Experimenting Field Approach, under review by *International Journal of Multiphase Flow*.

Software

Reservoir Simulation Toolbox: a parallel 3D solution for two-phase compositional flow simulations. (All by myself)

Wormhole Simulator: a parallel 3D solution for wormhole simulations. (All by myself)

Presentations

IGSSE Forum 2014, June 17 2014, Bürgerhaus, Austria

Presented the application of sparse grids to the flash calculations

Awards

2010 - 2015 **Fellowship & Academic Excellence Award**

King Abdullah University of Science and Technology

2009 **Studentship**

The Hong Kong University of Science and Technology

Language

Chinese as Native Language

GRE Total Score 1210

Verbal 410 Quantitative 800 Analytical Writing 3.0

IELTS Overall Band Score 7.0

Listening 7.0 Reading 8.5 Writing 5.5 Speaking 6.5

Skills and Certificates

Professional skills in computer science and technology

Professional experience in software development

Proficient experience in coding on supercomputers such as Shaheen

Petrel Reservoir Geomechanics Certificate by Schlumberger, May 2015

Petrel Reservoir Engineering Certificate by Schlumberger, April 2015



References

Dr. Shuyu Sun

Position: Associate Professor, KAUST

Email: Shuyu.Sun@kaust.edu.sa

Dr. David Keyes

Position: Professor, KAUST/Columbia University

Email: David.Keyes@kaust.edu.sa

Dr. Yushu Wu

Position: Professor, Colorado School of Mines

Email: ywu@mines.edu

Dr. Jisheng Kou

Position: Professor, Hubei Engineering University

Email: koujisheng@163.com

个人简历

基本信息			
姓名	吴远卿	性别	男
出生日期	1983年1月15日	民族	汉
教育程度	博士	籍贯	广西柳州市
身高	171cm	体重	68KG
电子邮件	wuyuanq@gmail.com, wuyuanq@126.com		
联系方式	手机: 13928772190 或者 00966-568856349 公共邮箱: 沙特阿拉伯吉达市阿卜杜拉国王科技大学 2376 邮箱		
			
教育背景			
时间	2010年9月-2015年12月	院校	沙特阿卜杜拉国王科技大学 (KAUST)
学位	博士	专业	应用数学和计算数学 (计算地球科学)
导师	孙树瑜教授	平均成绩	3.67/4.0
博士毕业论文	Parallel Reservoir Simulations with Sparse Grid Techniques and Applications to Wormhole Propagation		
时间	2005年9月-2008年7月	院校	北京大学
学位	硕士	专业	软件工程
导师	汪国平教授	平均成绩	85/100
硕士毕业论文	大规模分布式虚拟现实平台服务器负载均衡的设计与实现		
时间	2001年9月-2005年7月	院校	中国科学技术大学
学位	学士	专业	1. 金融学 2. 计算机科学
平均成绩	3.3/4		
工作经历			
时间	2008年6月-2009年5月	单位	美国穆迪 (Moody's) 信息咨询 (深圳) 有限公司
职位	软件工程师	行业	金融, 信息
职责	我和其他同事一起负责开发一个风险分析系统。该系统集成其它金融模块和数据, 利用穆迪的评级算法进行分析, 最后得出一个完整的评级报告。该项目需要用到.net 技术。		

时间	2009年9月—2010年8月	单位	香港科技大学计算机系
职位	研究助理&助教	行业	教育
职责	1. 在 Dimitris 教授的指导下进行时空数据库的研究。 2. 担任《JAVA 编程》和《计算机体系结构的设计和分析》两门课程的助教。		
学术经历			
时间	2014年1月—2014年12月	地点	阿卜杜拉国王科技大学
项目名称	油藏虫洞模拟		
<p>在石油开采领域，虫洞是一项常用的提高采油效率的技术。但是，现有的虫洞模拟技术是基于达西框架的，它不能精确地模拟虫洞的演进过程。因此，我提出了用最新的 Darcy-Brinkman-Forchheimer (DBF) 框架来模拟虫洞现象。我用 FORTRAN 和 MPI 独立开发了并行的 2 维和 3 维虫洞模型，并且在 KAUST 的超级计算机 SHAHEEN 上进行测试。结果表明，该并行程序取得了超线性加速。基于 DBF 框架的模拟结果更精确地描述了虫洞现象。另外，用最新的“实验域方法”来设置 Hypre 解法器中的系数矩阵也是该工作的一大创新。</p>			
时间	2011年10月—2013年12月	地点	阿卜杜拉国王科技大学
项目名称	油气田两相多组分流模型		
<p>我独立开发了一个并行的油气田两相多组分流模型，这也是我所在实验室与沙特阿美石油公司的主要合作项目。主要开发工具包括 MATLAB, FORTRAN 和 MPI。程序在 KAUST 的高性能计算机 SHAHEEN 上运行通过，取得了非常好的性能提高。</p>			
时间	2013年—2014年	地点	德国慕尼黑工业大学
项目名称	稀疏网格在提高闪存计算中的应用		
<p>我在德国慕尼黑工业大学做访问学生期间，主要和该校高级研究中心 (IAS) 的博士生一起研究如何把已经比较成熟的稀疏网格技术应用到油气藏模拟中的闪存计算中，使得在保持可容忍的计算误差的条件下，极大程度地提高闪存速度。我们用 FORTRAN 开发了所有的代码，并进行实验，实验结果表明：稀疏网格技术极大地提高了闪存速度，并进而提高了油气藏模拟的速度。</p>			
时间	2006年9月—2008年7月	地点	北京大学
项目名称	虚拟战场		
<p>虚拟战场是由北京大学信息学院多媒体实验室担任的国家 863 项目。在此项目中，我主要负责解决服务器负载不均衡的问题，并做出解决方案。我提出了一个动态调整服务器负载的算法，并用 C++ 编程实现该算法。相应的成果已经写入我的硕士毕业论文中。</p>			
学术会议			
时间	2014年6月17日	地点	奥地利布格豪森
会议名称	IGSSE 论坛 2014	演讲题目	稀疏表在闪存中的应用

发表论文

Y. Wu, C. Kowitz, S. Sun, A. Salama, Speeding Up the Flash Calculations in Two-phase Compositional Flow Simulations -- The Application of Sparse Grids, *Journal of Computational Physics*, 285 (2015) 88-99. (IF: 2.485, SJR: 2.039)

Y. Wu, A. Salama, S. Sun, Parallel Simulation of Wormhole Propagation with the Darcy-Brinkman-Forchheimer Framework, *Computers and Geotechnics*, 69 (2015) 564-577. (IF: 1.632, SJR: 2.158)

J. Kou, S. Sun, Y. Wu, Mixed Finite Element-based Fully Conservative Methods for Simulating Wormhole Propagation, *Computer Methods in Applied Mechanics and Engineering*, 298 (2016) 279-302. (IF: 2.959, SJR: 2.366)

Y. Wu, S. Sun, A. Salama, Parallelization of Two-phase Compositional Flow Simulations: Combination of Sparse Grids and State of the Art Solvers, minor revision required by *Computational Geosciences*.

Y. Wu, S. Sun, The Study of Equivalence of Two Models in Single-phase Multicomponent Flow Simulations, under review by *Computers & Mathematics with Applications*.

Y. Wu, S. Sun, 3D Parallel Simulation of Matrix Acidization with the Darcy-Brinkman-Forchheimer Framework and Experimenting Field Approach, under review by *International Journal of Multiphase Flow*.

开发软件

Reservoir Simulation Toolbox: 一个并行3D两相多组分流模拟软件。(独立完成)

Wormhole Simulator: 一个并行3D虫洞模拟软件。(独立完成)

奖励荣誉

时间	2010年9月-2015年12月	奖励名称	阿卜杜拉国王科技大学奖学金 (fellowship)
时间	2010年9月-2015年12月	奖励名称	阿卜杜拉国王科技大学优秀学术奖
时间	2009年9月-2010年8月	奖励名称	香港科技大学优秀学术奖金

技能水平

英语	熟练掌握英语, 雅思7分
计算机	精通 C, C++, FORTRAN, MATLAB, 熟悉 JAVA, C#等语言; 熟练操作 WINDOWS, MAC 和 LINUX 操作系统; 大型软件开发能力; 2年超级计算机编程经验。
证书	Petrel Reservoir Geomechanics Certificate by Schlumberger, May 2015 Petrel Reservoir Engineering Certificate by Schlumberger, April 2015

推荐人

Shuyu Sun (德州大学奥斯汀分校博士)
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Omar Knio (麻省理工学院博士)
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Yushu Wu (加州大学伯克利分校博士)
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