V. Ganesh

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Current Association:

I work at VLife Sciences (division of Novalead Pharma Pvt. Ltd.) as a Software Architect. Presently I am leading the development of machine learning based wound documentation system and Nurse Assisted trial tracking system for an upcoming Phase 3 trial at Novalead.

I am also a co-founder at OneGreenDiary Software Pvt. Ltd., which is engaged in building cloud-based platform to help digitize operations of small and medium merchants owning single or multiple outlets and provide a platform to connect with their customers.

I am also a co-founder at Scientific Interactive LLP, which is engaged in the scientific software development and research.

Work and Teaching Experience:

Research and Consultancy

- April 2020 - January 2021:
    - Supporting a third party for using WoundlyClinical in two currently running Phase 3 clinical trials.
    - Building a new mobile first, modern EDC system (Electronic Data Capture) for regulatory approved clinical trial termed Clinikaly. This is proposed to be used for an upcoming academic and a commercial client for capturing field data in a large diabetic foot ulcer and a COVID-19 drug repurposing trial.
    - Design and develop frameworks for form builder, reporting and for third party data acquisition in the Clinikaly system.
- October 2019 - March 2020:
    - Building a new product offering, WoundlyClinical - a regulatory compliant, wound documentation tool specifically for multi centre clinical trial.
    - Scaling the WoundlyClinical backend to be enterprise ready for supporting multiple simultaneous clinical trials.
    - Improving core Tensorflow model for wound outline detection in Woundly.
    - Deployment of WoundlyClinical for a third party multi centre DFU clinical trial - first commercial deployment of the product.
- August 2018 - September 2019:
    - Building backend tools and workflows for a Phase 3 clinical trial on diabetic foot ulcer.
    - Advancing Wound documentation tool (Woundly) with improved algorithms (image processing augmented with deep neural networks using Tensorflow). Also, making this tool generically available to other clinicians specifically podiatrists treating diabetic foot ulcer.

  - Continuing to build and collaborate with OneGreenDiary team for various internal and external projects. Also guided intern to build a recommended engine for billing and discount system for small and medium restaurants.

- August 2017 – June 2018:
  - Nurse assisted trial tracking system for an upcoming Phase 3 trial at Novalead
  - Machine learning based Wound documentation assisted by a smartphone application
  - Capturing and helping in implementation of various workflow improvement in core OneGreenDiary backend.
- January 2017 – July 2017:
  - Internal Patent tracking system for tracking various patent applications of Novalead
  - Initial planning of Nurse assisted trial tracking system
  - Architecting OneGreenDiary backend
- January 2015 – December 2016:
  - Researching on various ways to improve prediction accuracy and discoverability in the unified platform for drug repurposing at Novalead. Leading a new initiative to build mobile apps for some of the VLife services.
  - Co-founded OneGreenDiary, a cloud based platform to help digitize local merchant and connect with their local customers.
- June 2014 – December 2014: Developed and implemented algorithm for detecting maximum common substructure from a set for molecular graphs in VLife MDS suite, automated literature survey for Toxicity prediction services. Further improved the unified platform for drug repurposing, which is now being actively used to provide services to external industry clients.
- April 2014 – July 2014: Lead the development of a system for automated Toxicity predictions, report generation and project management for computational toxicity services offered by VLife to a large percentage of Indian / MNC pharma companies.
- July 2013 – March 2014: Lead the development of a unified software platform for computer aided drug repurposing. Developed algorithms for automated literature survey and hypothesis generation to help in narrowing down the amount of literature to be used by domain experts for the purpose of drug repurposing. These systems are currently being used by domain experts at Novalead Pharma for internal drug repurposing programs.
- November 2012 – June 2013: Part of the team developing a solution for computer aided drug discovery. My primary role involves architectural design, development and deployment of the complete application stack enabling the discovery solution platform. Also involved in development and design of a scientific database for an external client.
- October 2011 – October 2012: Contributed to the development of a new shape based method for virtual screening of molecules and a new smartphone based application for computational chemists, both of which have resulted into filing provisional patent. During this period, I also came up with the idea and related implementation of domain specific workflows for VLife Molecular Design Suite.
- August 2010 – September 2011: Continuing to work at VLife Sciences, leading the way for many HPC related improvements in the core computational products offered by VLife.

This has also resulted in close collaboration with applications group at Intel India, particularly towards multi-core optimizations of VLife products on the Sandy bridge platform. During this period, I also guided two interns from ISSC, University of Pune for their master's thesis.

- November 2008 – August 2010: Worked as a **Post-Doctoral Fellow** at the Computer Systems Group headed by Alistair Rendell at Department of Computer Science, Australian National University. My primary work involved evaluation of a new high performance programming language, X10, being developed by IBM, with specific focus on exploring programmability and performance of computational kernels. I also explored the use of alternate and novel hardware platforms for quantum chemical applications. My work also involved development of generic programming environments for scientific computing.
- Consultancy with VLife Sciences Pvt. Ltd., India for porting their Life sciences products from windows to Linux platform using Qt, Open GL and rewritten simplified reflection framework, during the period March-September 2008.
- Internship at Australian National University, Canberra during September – November 2006. During this time I worked with Dr. Alistair Rendell and his group. My primary work involved porting Molecular Tailoring Approach (MTA) code to a large SGI Altix cluster, its benchmarking and improving certain aspects of the MTA code.

Teaching experience

- Taught introductory course in MPI at CMS, University of Pune, April 2007 and April 2008.
- Taught one trimester of C Programming course at CMS, University of Pune, June – October 2005.
- Taught two semesters of Scientific Visualization course at ISSC, University of Pune, June – December 2004 and 2005.
- Worked at Aptech ltd. as an instructor for Java 2 platform for 8 months (June 2000 – March 2001). Apart from this, I also have an experience of conducting corporate batches for Cummins, Aptech World Wide and Tata Infotech. The corporate trainings were conducted in Java and Oracle8i.

Education:

- **University of Pune, Pune, India** *(August 2002 – August 2008)*

  Ph. D. in Scientific Computing. Thesis title: "*Ab initio* Treatment of Large Molecules: Algorithm Development, Parallelization and Applications".

  Advisor: Professor Shridhar R. Gadre

  The research for this dissertation focused on the development of new algorithms for *ab initio* treatment of large molecular systems. The thesis also deals with the development of an integrated development environment for a computational chemist.

- **University of Pune, Pune, India** *(June 2000 - July 2002)*

  MCS (Scientific Computing). Thesis title: "Estimating properties of large molecules in a computationally effective manner".

  Thesis Guide: Professor Shridhar R. Gadre

Final Grade: Distinction

- **Bharati Vidyapeeth, Pune, India** *(June 1997 - April 2000)*

  BCS (Computer Science).

  Final Grade: Distinction

- **Air Force School, Pune, India** *(June 1994 – April 1995* and *June 1995 - April 1997)*

  CBSE (SSC, 10) *and* CBSE (HSC, 10+2)
  Final Grade: Distinction

Research Publications:

- "X10 as a parallel language for scientific computing: practice and experience", J. Milthorpe, V. Ganesh, A. P. Rendell and D. Grove, IPDPS, 1067, ISBN: 978-0-7695-4385-7 (2011).
- "Validity of current force fields for simulation of boron nitride nanotubes", T. A. Hilder, R. Yang, V. Ganesh, D. Gordon, A. Bliznyuk, A. P. Rendell and S.-H. Chung, Micro & Nano Letters, **5**, 150 (2010).
- "Use of Cluster OpenMP with the Gaussian Quantum Chemistry Code: A Preliminary Performance Analysis", R. Yang, J. Cai, A. P. Rendell and V. Ganesh, IWOMP 2009, LNCS. **5568**, 53 (2009).
- "WebMTA: A Web-Interface for *ab inito* Geometry Optimization of Large Molecules Using Molecular Tailoring Approach", R. Kavatekar, S. Khire, V. Ganesh, A. P. Rahalkar and S. R. Gadre, J. Comput. Chem. **30**, 1167 (2009).
- "MeTA Studio: A Cross Platform, Programmable IDE for Computational Chemists", V. Ganesh, J. Comput. Chem. **30**, 661 (2009).
- "Enabling *ab inito* Hessian and frequency calculations of large molecule", A. P. Rahalkar, V. Ganesh and S. R. Gadre, J. Chem. Phys. **129**, 234101 (2008).
- "WebProp: Web Interface for *Ab Initio* Calculation of Molecular One-Electron Properties", V. Ganesh, R. Kavatekar, A. P. Rahalkar, and S. R. Gadre, J. Comput. Chem. **29**, 488 (2008).
- "Ab initio Treatment of Large Molecules: Cut-and-Stitch the Tailor's Way", S. R. Gadre, A. P. Rahalkar, and V. Ganesh, IANCAS Bulletin 4, 267 (2006).
- "Molecular tailoring approach for geometry optimization of large molecules: Energy evaluation and parallelization strategies", V. Ganesh, R. K. Dongare, P. Balanarayan, and S. R. Gadre, *J. Chem. Phys.* **125**, 104019 (2006).
- "Molecular Tailoring Approach: Towards PC-based *ab initio* Treatment of Large Molecules", S. R. Gadre and V. Ganesh, *J. Theort. Comput. Chem.* **5**, 835 (2006).
- S. R. Gadre, K. Babu and V. Ganesh, in *Recent Trends in Practice and Theory of Information Technology: Proceedings of NRB Seminar*, Edited by S.N. Maheshwari, Viva Books, New Delhi, p86 (2005).
- "Tailoring approach for exploring electron densities and electrostatic potentials of molecular crystals", K. Babu, V. Ganesh, S. R. Gadre and N. E. Ghermani, *Theoret. Chim. Accts.* **111**, 255 (2004).

- "Many-body interaction analysis: Algorithm development and application to large molecular clusters", Anant D. Kulkarni, V. Ganesh and Shridhar R. Gadre, *J. Chem. Phys.* **121**, 5043 (2004).

Book / Book Chapters:

- "*Ab initio* Treatment of Large Molecules: Algorithm Development, Parallelization and Applications", V. Ganesh, LAP LAMBERT Academic Publishing, ISBN: 3838351851 (2010).
- "Molecular Tailoring: An art of the possible for *ab initio* treatment of large molecules and molecular clusters", A. P. Rahalkar, S. D. Yeole, V. Ganesh, S. R. Gadre in Linear-Scaling Techniques in Computational Chemistry and Physics, **13**, 513, ISBN: 978-90-481-2852-5 (2011).

Conferences / Talks / Workshop:

- Presented work on Molecular Tailoring Approach, including its parallel and distributed implementation on PC cluster and Param Padma (a supercomputer developed by C-DAC, Pune) in the following conferences:
  - Presented a poster at Theoretical Chemistry Symposium, organized by University of Trichy, Trichy, December 2006.
  - An oral presentation at Raman Memorial Conference, organized by Department of Physics, University of Pune, February 2005.
  - Presented a poster at Theoretical Chemistry Symposium, organized by BARC, Mumbai, December 2004.
  - Presented a poster at National Seminar on Crystallography, organized by NCL, Pune, December 2004.
  - Participated in HPC Asia, organized by C-DAC, December 2002.
- "Talk" with MeTA Studio, OzLabs Unconference, ANU Canberra, October 2009.
- "A programmable cross-platform environment for computational chemists", eResearch Australiasia, Sydney, 9-13 November 2009.
- "A case for scientific applications on smartphones", ICONCT'09, Shivakashi, India, 9-11 December 2009.
- "Alice in the multicore land", Changing Paradigms in Theoretical and Computational Chemistry, Pune, 18-20 December 2009.
- "X10 language for programming multi-core applications", Invited talk at Computational Research Laboratories, Pune, 24 September 2010.
- Co-author in conference papers:
  - "New programming languages for petascale computing: Using X10 to develop computational chemistry applications", A. P. Rendell, J. Milthorpe, V. Ganesh and D. Grove, Pacifichem, 2010.
  - "Novel shape-based methods for virtual screening", S. A. Kulkarni, V. Ganesh and K. Jadhav, International Conference on Mathematical and Theoretical Biology, Pune, 2012 (Organized by IISER, Pune).

- Woundly app presented at Annual Conference of the Diabetic Foot Society of India, Gwalior, 2019.
- "Woundly: a digital wound monitoring tool" at PGIMER, India and Manchester Metropolitan University, UK - International Collaborative Diabetic Foot Conference, PGIMER Chandigarh, 8-9 February 2020.

Technical reports and white papers:

- "Workflows in VLifeMDS (A technical perspective)", V. Ganesh, VLife Whitepaper, January 2013 (available from portal.vlifesciences.com).
- "Optimizing VLife Molecular Design Suite Using Intel Parallel Studio XE", V. Ganesh, A. Charya, K. Kakulte and S. Doss, Intel Software Dispatch, December 2011.
- "Use of Acumem ThreadSpotter for Profiling the Gaussian 03 Package", R. Yang, V. Ganesh and A. P. Rendell, The Australian National University, May 2009.
- "Estimating properties of large molecules in a computationally effective manner", V. Ganesh and M. Kashid, MCS dissertation, Interdisciplinary School of Scientific Computing, University of Pune, India (2002).

Conference Reviewer:

- NDT 2009, The First International Conference on 'Networked Digital Technologies', IEEE sponsored conference, Ostrava, The Czech Republic, July 2009.
- IPDPS-PDSEC 2013, The 14th IEEE International Workshop on Parallel and Distributed Scientific and Engineering Computing, Boston, Massachusetts USA, May 2013.

Professional Membership:

- Professional member of ACM since 2011
- Associate member of NCSSS since 2018

Other Technical Qualifications:

- **Programming Languages:**

  Conversant with C/C++, Java, Python and Javascript.

  Working knowledge of Fortran 77/90, C#, PHP, HTML5, R, Lisp and Swift.

- **Libraries and Tools conversant with:**

  Java class libraries, NetBeans IDE, Visual Studio, OpenGL, Renderman (3delight and JRMan), .Net SDK, Qt toolkit, OpenMP, MPI, AngularJS, NodeJS, ionic, ionic/PWA, Bootstrap, Mongodb, Caffe, OpenCV, Tensorflow, GNU compiler tools, gdb and valgrind.

- **Platforms:**

  Windows, Linux, OSX, AIX, Solaris, Windows Phone, iOS and Android.

- **Others:**
  - Conversant with OOP and Design Patters with working knowledge of UML.

- Working knowledge of Oracle and MySQL database, and experience in administering Linux web server.
- Knowledge of Cell SDK, GPGPU programming and PGAS languages (X10).
- Knowledge of Cloud computing paradigm and Amazon EC2 platform.
- Experience of application development and deployment on HPC hardware from C-DAC, ANUSF and IBM BlueGene.
- Fair understanding and practical experience of data analytics, machine learning and image processing methods and tools.

Personal Information

Date of birth: March 12th, 1980

Nationality: Indian

Miscellaneous:

- Gold medalist in the bachelor's course from Bharati Vidyapeeth.
- Won second prize for oral presentation at Raman Memorial Conference at University of Pune.
- Open source projects:
  - My git repo: `https://github.com/tovganesh`
  - I am currently heading development of an IDE (MeTA Studio) that intends to provide a programmable platform for computational chemists. Hosted at: `http://code.google.com/p/metastudio/`
  - Contributed to first set of scientific applications implemented using X10 language (ANUChem) hosted at: `http://squirrel.anu.edu.au/hg/public/x10-apps/`
  - MathUtils (a set of math utility classes for linear algebra written in Java) and QuntumJ (a toy implementation of *ab inito* quantum chemical code in Java) one of the first set of QM code implementation for Java.
  - A member of PyQuante (Quantum Chemistry in Python) project hosted at SourceForge. Contributed Hartree-Fock code for S60 based smart phones. Co-hosted at: `http://sites.google.com/site/tovganesh/s60`
- Interests:

  I have broad interests in scientific computing, systems software, user interface design, quantum computing, artificial intelligence, intelligent networks, cyber security, and development of accessible computing solutions for the masses.
- Hobbies:

  Listening to Indian classical music, digital photography, traveling to new places and maintaining my blog at `http://tovganesh.blogspot.com`.