

Curriculum Vitae

Ananth Kalyanaraman

Assistant Professor

School of Electrical Engineering and Computer Science

Washington State University

P.O Box 642752 Pullman, WA 99164

Office: EME 237

Phone: (509) 335-6760

Fax: (509) 335-3818 (departmental)

Email: ananth@eecs.wsu.edu

Web: <http://www.eecs.wsu.edu/~ananth>

Revised: June, 2008

RESEARCH INTERESTS

- Bioinformatics and Computational Biology
- Parallel Algorithms and Applications
- Combinatorial Pattern Matching and String Algorithms

EDUCATION

Ph.D. in Computer Engineering, Summer 2006

Dissertation Title: Large-scale Methods in Computational Genomics

(Research Excellence Award, Iowa State University)

Adviser: Prof. Srinivas Aluru

Iowa State University, Ames, IA, USA

GPA: 3.95/4.0

M.S. in Computer Science, Summer 2002

Thesis Title: Parallel Clustering of Expressed Sequence Tags

(Research Excellence Award, Iowa State University)

Adviser: Prof. Srinivas Aluru

Iowa State University, Ames, IA, USA

GPA: 3.92/4.0

B.E. in Computer Science and Engineering, May 1998

Visvesvaraya National Institute of Technology,

(Formerly, Regional Engineering College, Nagpur)

Nagpur, Maharashtra, India

Grade Percentage: 78%

EXPERIENCE

| | |
|---|--|
| Assistant Professor (Aug 2006 - present) | School of Electrical Engineering and Computer Science Molecular Plant Sciences Graduate Program Center for Integrated Biotechnology Washington State University Pullman, WA, USA |
| Graduate Assistant (Jan 2001 - Aug 2006) | Department of Electrical and Computer Engineering Iowa State University Ames, IA, USA |
| Summer Intern (May-Aug 2005) | IBM Research, Yorktown Heights, NY Biomolecular Dynamics and Scalable Modeling |
| Summer Intern (May-Aug 2004) | IBM, Rochester, MN BlueGene/L Scaling and Performance Team |
| Summer Intern (Jun-Aug 2003) | Pioneer Hi-Bred International Inc., Johnston, IA Bioinformatics Group |
| Associate Consultant (Jan-Jul 2000) | Citibank NA, London, UK |
| Associate Consultant (Aug 1998 - Jan 2000) | Citicorp Overseas Software Ltd., Mumbai, India |

PUBLICATIONS

Refereed Journal Publications

- J1. (2007) **A. Kalyanaraman**, S.J. Emrich, P.S. Schnable, S. Aluru. Assembling genomes on large-scale parallel computers. *Journal of Parallel and Distributed Computing (JPDC)*, 67(12):1240-1255.
- J2. (2006) **A. Kalyanaraman**, S. Aluru. Efficient algorithms and software for detection of full-length LTR retrotransposons. *Journal of Bioinformatics and Computational Biology (JBCB)*, 4(2):197-216.
- J3. (2004) M. Mitreva, A.A. Elling, M. Dante, A.P. Kloek, **A. Kalyanaraman**, S. Aluru, S.W. Clifton, D.M. Bird, T.J. Baum, J.P. McCarter. A survey of SL1-spliced transcripts from the root-lesion nematode *Pratylenchus penetrans*. *Molecular Genetics and Genomics (MGG)*, 272:138-148.
- J4. (2003) **A. Kalyanaraman**, S. Aluru, V. Brendel, S. Kothari. Space and time efficient parallel algorithms and software for EST clustering. *IEEE Transactions on Parallel and Distributed Systems (TPDS)*, 14(12):1209-1221.
- J5. (2003) **A. Kalyanaraman**, S. Aluru, S. Kothari, V. Brendel. Efficient clustering of large

EST data sets on parallel computers. *Nucleic Acids Research (NAR)*, 31(11):2963-2974.

Refereed Conference Publications

- C1. (2008) C. Wu, **A. Kalyanaraman**. An efficient parallel approach for identifying protein families in large-scale metagenomic data sets. To appear in *Proc. IEEE/ACM Supercomputing Conference (SC08)*, Austin, TX, Nov. 15-21. (Acceptance Ratio: 21.2%)
- C2. (2008) W. Davis, **A. Kalyanaraman**, D. Cook. An information theoretic approach for the discovery of irregular and repetitive patterns in genomic data. To appear in *Proc. IEEE Computational Intelligence in Bioinformatics and Bioengineering (CIBCB'08)*, Sun Valley, Idaho, Sept. 15-17.
- C3. (2007) S.J. Emrich, **A. Kalyanaraman**, S. Aluru. Massively parallel clustering of Expressed Sequence Tags, *Proc. ISCA 20th International Conference on Parallel and Distributed Computing Systems (PDCS'07)*, 254-261.
- C4. (2006) **A. Kalyanaraman**, S. Aluru, P.S. Schnable. Turning repeats to advantage: Scaffolding genomic contigs using LTR retrotransposons. *Proc. Life Sciences Society Computational Systems Bioinformatics Conference (CSB'06)*, 167-178. (Acceptance Ratio: 19.2%)
- C5. (2006) **A. Kalyanaraman**, S.J. Emrich, P.S. Schnable, S. Aluru. Assembling genomes on large-scale parallel computers. *Proc. IEEE International Parallel and Distributed Processing Symposium (IPDPS'06)*. (Acceptance Ratio: 23%)
Best Paper Award.
- C6. (2005) **A. Kalyanaraman**, S. Aluru. Efficient algorithms and software for detection of full-length LTR retrotransposons. *Proc. IEEE Computational Systems Bioinformatics Conference (CSB'05)*, 56-64. (Acceptance Ratio: 12.2%)
Best Paper Award.
- C7. (2004) P. Ko, M. Narayanan, **A. Kalyanaraman**, S. Aluru. Space-conserving optimal DNA-protein alignment. *Proc. IEEE Computational Systems Bioinformatics Conference (CSB'04)*, 77-85. (Acceptance Ratio: 31%)
- C8. (2002) **A. Kalyanaraman**, S. Aluru, S. Kothari. Space and time efficient parallel algorithms and software for EST clustering. *Proc. International Conference on Parallel Processing (ICPP'02)*, 331-339. (Acceptance Ratio: 36%)

Refereed Workshop Publications

- W1. (2002) **A. Kalyanaraman**, S. Aluru, S. Kothari. Parallel EST clustering. *Proc. First International Workshop on High Performance Computational Biology (HiCOMB '02)*, held in conjunction with the *IEEE International Parallel and Distributed Processing Symposium*.

Posters and Extended Abstracts

- EA1. (2008) C. Wu, **A. Kalyanaraman**, A. Dhingra. Enabling Cost-Effective Sequencing Of Arbitrarily Long Conserved DNA Sequences. *Proc. Plant & Animal Genomes XVI Conference (PAG'08)*, San Diego, January 12-16.

- EA2. (2007) C. Wu, **A. Kalyanaraman**, A. Dhingra. An efficient computational framework for amplifying arbitrarily long conserved DNA sequences. *Proc. LSS Computational Systems Bioinformatics Conference (CSB'07)*, UC San Diego, August 13-17.
- EA3. (2007) W. Davis, **A. Kalyanaraman**, D. Cook. An information theoretic approach for the discovery of irregular and repetitive patterns in genomic data. *Proc. LSS Computational Systems Bioinformatics Conference (CSB'07)*, UC San Diego, August 13-17.

Book Chapters

- BC1. (2005) **A. Kalyanaraman**, S. Aluru. “Expressed Sequence Tags: Clustering and applications” in *Handbook of Computational Molecular Biology*, Edited by S. Aluru, Chapman & Hall/CRC Computer and Information Science Series.
- BC2. (2005) S. Emrich, **A. Kalyanaraman**, S. Aluru. “Algorithms for large-scale clustering and assembly of biological sequence data” in *Handbook of Computational Molecular Biology*, Edited by S. Aluru, Chapman & Hall/CRC Computer and Information Science Series.
- BC3. (2004) R. Raje, **A. Kalyanaraman**, N. Nayani. “Distributed-object computing tools” in *Tools and Environments for Parallel and Distributed Computing*, Edited by S. Hariri and M. Parashar, Wiley-Interscience.

Conference Tutorials (Peer-reviewed)

- Tut1. (2007) S. Aluru, D.A. Bader, **A. Kalyanaraman**. High-performance Computing Methods for Computational Genomics. Presented at the *2007 IEEE International Parallel and Distributed Processing Symposium (IPDPS'07)*, Long Beach, CA, March 26-30.
- Tut2. (2006) S. Aluru, D.A. Bader, **A. Kalyanaraman**. High-performance Computing Methods for Computational Genomics. Presented at the *2006 IEEE/ACM Supercomputing Conference (SC'06)*, Tampa, FL, November 11-17.

Software Technologies

- SW1. *PaCE*: Software for parallel clustering of DNA sequences. Copyrighted with Iowa State University.
- SW2. *LTR-par*: Software for parallel identification of full-length LTR retrotransposons in genomes.

Invited Talks and Presentations

- (2007) **A. Kalyanaraman**. Algorithmic & HPC Issues in Microbial Community Genomics. DOE Exascale Townhall Meeting, Oak Ridge National Laboratory, May 17-18.
- (2007) **A. Kalyanaraman**. HPC Methods for Large-scale Computational Genomics Applications. Pacific Northwest National Laboratory, March 23.

FUNDING

- PI**, \$14,700, Algorithms & Software for Large-scale Metagenomics, WSU Seed Grant (jointly funded by WSU Office of Research & WSU Foundation), 5/16/2008-8/15/2009.

HONORS AND AWARDS

1. Research Excellence Award, Iowa State University, Summer 2006.
2. Best Paper Award. *Proc. IEEE International Parallel and Distributed Processing Symposium, 2006 (IPDPS'06)*.
3. Best Paper Award. *Proc. IEEE Computational Systems Bioinformatics Conference, 2005 (CSB'05)*.
4. IBM Ph.D. Fellowship, Fall 2004 - Spring 2006.
5. Pioneer Hi-Bred Graduate Research Fellowship, January - December 2003.
6. Best Poster Award for Computing Applications. *The International Symposium on Modern Computing*, Iowa State University, 2003.
7. Research Excellence Award, Iowa State University, Summer 2002.

TEACHING ACTIVITIES

Course Instruction

1. Designed and Taught: “Advanced Data Structures” (Cpt S 223), School of Electrical Engineering and Computer Science, Washington State University, Spring 2007.
2. Designed and Taught: “Fundamental Algorithms in Computational Genomics” (Cpt S 580), School of Electrical Engineering and Computer Science, Washington State University, Spring 2007.
3. Teaching Assistant, Discrete Computational Structures (COM S 330), 3 credit course, Iowa State University, Spring 2001.

Curriculum Development

1. Designed and presented a day-long workshop on “High-performance Computing for Bioinformatics” as part of the SC07 (Supercomputing 2007) Education program’s UTEP’07: Parallel and Cluster Computing Workshop, University of Texas at El Paso, May 20-26, 2007.

PROFESSIONAL ACTIVITIES

Program Committee Memberships

1. Supercomputing, 2008 (SC-08).
2. International Conference on High Performance Computing, 2008 (HiPC-08).
3. ACS/IEEE International Conference on Computer Systems and Applications, 2008 (AICCSA-08).
4. IEEE International Workshop on High Performance Computational Biology, 2008 (HiCOMB’08).
5. International Conference on Parallel Processing, 2007 (ICPP’07).

6. IEEE International Parallel and Distributed Processing Symposium, 2007 (IPDPS'07).
7. Parallel Bio-Computing Workshop, 2007 (PBC'07).

Proposal and Paper Reviews

1. National Science Foundation Proposal Mail Review, CCF - Computing Processes & Artifact, 2006.
2. Paper Review: BMC Bioinformatics, Nucleic Acids Research, Parallel Computing, Journal of Parallel and Distributed Computing.

Other Academic Service

1. Member, Faculty Search Committee, School of Electrical Engineering and Computer Science, Washington State University, 2006-2007.
2. Member, Graduate Advisory Committee, Department of Computer Science, Iowa State University, 2001-2003.
3. Member, Colloquium Committee, Department of Computer Science, Iowa State University, 2001-2003.

Training and Certification

1. Preparing Future Faculty (certification), Iowa State University, 2003-2004.
2. Computing Writer's Workshop (training), Department of Computer Science, Iowa State University, 2003.
3. Personal Software Process (certification), Software Engineering Institute, Carnegie Mellon University, 1999.

Memberships in Professional Societies

1. International Society for Computational Biology (*ISCB*) Member, 2006-.
2. Life Sciences Society (*LSS*) Member, 2006-.
3. Association for Computing Machinery (*ACM*) Member, 2002-.
4. Institute of Electrical and Electronics Engineers, Inc. (*IEEE*) Member, 2002-.
5. Society for Industrial and Appplied Mathematics (*SIAM*) Member, 2004-.