
Volodymyr Kindratenko

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Professional Experience

Senior Research Scientist **2004-present**
National Center for Supercomputing Applications, University of Illinois at Urbana-Champaign

My research interests include high-performance computing and special-purpose computing architectures (architecture, algorithms, applications, programming models, and performance modeling).

Adjunct Associate Professor **2013-present**
Visiting Lecturer **2009-2013**

Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign

I teach freshman and sophomore computer engineering courses

- **ECE 190** – Introduction to Computing Systems (F09, SP10, F10, SP11, F11, F12)
- **ECE 198JL** – Introduction to Computer Engineering (SP13, F13)
- **ECE 290** – Computer Engineering I (F11, SP12, SP13)
- **ECE 397/396** – Individual Study in ECE Problems/Honors Project

Visiting Lecturer **2012-2013**
Faculty of Electrical-Electronics Engineering, HoChiMinh City University of Technology, Vietnam

- **ECE 290** – Computer Engineering I (SU12, SU13)

Research Scientist **1998-2004**

Postdoctoral Research Associate **1997-1998**

National Center for Supercomputing Applications, University of Illinois at Urbana-Champaign

Conceptual design of a software-defined radio-based sensor platform and development of DSP algorithms and software. Architecture design and software implementation of a proximity-based wide-area location tracking system IntelliBadge®. Design of an augmented reality system for enhanced vehicle operator visibility. Design and implementation of a virtual reality system for real-time human-in-the-loop simulation of earth moving machinery. Development of geometry optimization algorithms and software for processing large CAD-based virtual reality models. Development of electromagnetic trackers calibration methodology and software. Development of vehicle operator controls interface with virtual environments. Implementation of a multi-projector display color balancing system. Tiled display wall and visualization cluster deployment. Development of a distributed virtual reality system for collaborative product design.

Education

D.Sc. – graduated with the *Greatest Distinction*
University Institute of Antwerp, University of Antwerp, Antwerp, Belgium **1993-1997**

Thesis: *Development and application of image analysis techniques for identification and classification of*

microscopic particles. Developed and applied digital image processing and analysis techniques for SEM, TEM, and optical imagery for analyzing and classifying airborne and other microscopic particle shapes.

M.Sc. – graduated with an **Honorary Diploma**

Vynnychenko State Pedagogical University, Kirovograd, Ukraine

1988-1993

Thesis: *Automatic object classification with a teacher.* Created an expert system for object classification based on Nearest Neighbor and Confidence Intervals methods for supervised classification.

Grants and awards

Grants

- Co-PI: *Collaborative Research: Preparing Lattice QCD for Accelerated Computing and Future Algorithms*, NSF, \$288K, 2012-2015.
- Co-PI: *Creating The World's Best Computer Engineering Core*, UIUC Strategic Instructional Initiatives Program, \$125K, 2012-2013.
- Co-PI: *Collaborative Research: Cyberinfrastructure and Research Facilities: Chemical Computations on Future High-end Computers*, NSF CHE-0626354, \$1,163K, 2006-2012.
- PI: *SGER: Investigating Application Analysis and Design Methodologies for Computational Accelerators*, NSF STCI #0810563, \$166K, 2008-2009.
- Co-PI: *Developing and Deploying Advanced Astrophysical Algorithms to Novel Supercomputing Hardware*, NASA IASR, \$779K, 2006-2009.
- Co-PI: *Next Generation RFID Systems: People and Object Tracking for Homeland Security Applications*, University of Illinois Critical Research Initiative, \$180K, 2005-2007.
- Co-PI: *Geoscience Applications on Petascale Systems: Requirements Workshops*, NSF ATM #0540688, \$100K, 2005-2009.
- PI: *Advanced Backhoe Display Development*, Caterpillar Inc., \$233K, 2004-2005.
- Co-PI: *Software Defined Radio and Extensible Sensor Platform*, NCASSR (ONR), \$600K, 2004-2005.
- Co-PI: *Software Defined Radio and Extensible Sensor Platform*, NCASSR (ONR), \$984K, 2003-2004.
- PI: *Virtual Reality Earthmoving Machinery Prototyping R&D* (multiple projects), Caterpillar Inc., \$80K, 2003-2005.
- *IntelliBadge*, NSF PACI REU, \$12K, 2003-2004.
- Co-PI: *ITR/AP: Simulation of Machine-Medium Interaction in a Real-Time Virtual Environment*, NSF (award #0113745), \$399K, Caterpillar Inc., \$452K, 2001-2004.
- *Development of software tools for simplified and accurate calibration of electromagnetic trackers in virtual environments*, NSF PACI REU, \$18K, 2000-2001.
- Co-PI: *Unencumbered Display and Interaction*, NCSA Private Sector Program, \$292K, 2000-2001.
- *Application of Virtual Reality Technology for Large Model Visualization and Simulation*, NSF PACI REU, \$8K, 1999-2000.
- *Calibration of Electromagnetic Tracking Devices*, NSF PACI REU, \$8K, 1999-2000.

Awards

- *Outstanding Service Award*, 9th ACS/IEEE International Conference on Computer Systems and Applications, 2011

- SRC Award for Excellence in Reconfigurable Computing, 2007
- D.Sc. with the *Greatest Distinction*, University of Antwerp, Belgium, 1997
- M.Sc. with an *Honorary Diploma*, Vynnychenko State Pedagogical University, Ukraine, 1993

Publications

Journal papers

- F. Pratas, P. Trancoso, L. Sousa, A. Stamatakis, G. Shi, **V. Kindratenko**, *Fine-grain Parallelism using Multi-core, Cell/BE, and GPU Systems*, Parallel Computing, vol. 38, no. 8, pp. 365-390, 2012.
- **V. Kindratenko**, A. Myers, R. Brunner, *Implementation of the two-point angular correlation function on a high-performance reconfigurable computer*, Scientific Programming, vol. 17, no. 3, pp. 247-259, 2009.
- G. Shi, **V. Kindratenko**, S. Gottlieb, *The bottom-up implementation of one MILC lattice QCD application on the Cell blade*, International Journal of Parallel Programming, vol. 37, no. 5, pp. 488-507, 2009.
- G. Shi, **V. Kindratenko**, I. Ufimtsev, T. Martinez, J. Phillips, S. Gottlieb, *Implementation of scientific computing applications on the Cell Broadband Engine*, Scientific Programming, vol. 17, no. 1-2, pp. 135-152, 2009.
- T. El-Ghazawi, E. El-Araby, M. Huang, K. Gaj, **V. Kindratenko**, D. Buell, *The Promise of High-Performance Reconfigurable Computing*, IEEE Computer, vol. 41, no. 2, pp. 78-85, 2008.
- **V. Kindratenko**, and W. Sherman, *Neural network-based calibration of electromagnetic tracking systems*, Virtual Reality, 2006, vol. 9, pp. 70-78.
- **V. Kindratenko** and D. Pointer, *Mapping a sensor interface and a reconfigurable communication system to an FPGA core*, Sensor Letters, 2005, vol. 3, no. 2, pp. 174-178.
- **V. Kindratenko**, *On using functions to describe the shape*, Journal of Mathematical Imaging and Vision, 2003, vol. 18, no. 3, pp. 225-245.
- **V. Kindratenko**, *A survey of electromagnetic position tracker calibration techniques*, Virtual Reality: Research, Development, and Applications, 2000, vol. 5, pp. 169-182.
- **V. Kindratenko**, *A comparison study of the accuracy of electromagnetic and ultrasound/inertia position tracking systems*, Presence: Teleoperators and Virtual Environments, 2001, vol. 10, no. 6, pp. 657-663.
- **V. Kindratenko**, *Calibration of electromagnetic tracking devices*, Virtual Reality: Research, Development, and Applications, 1999, vol. 4, pp. 139-150.
- **V. Kindratenko**, B. Treiger and P. Van Espen, *Classification of silver halide microcrystals via K-NN clustering of their shape descriptors*, Journal of Chemometrics, 1997, vol. 11, pp. 131-139.
- **V. Kindratenko**, B. Treiger and P. Van Espen, *Shape reconstruction of partially overlapping objects in SEM images: applied to silver halide microcrystals*, Microscopy, Microanalysis and Microstructures, 1997, vol. 8, pp. 115-123.
- **V. Kindratenko**, B. Treiger and P. Van Espen, *Chemometrical approach to the determination of fractal dimension(s) of real objects*, Chemometrics and Intelligent Laboratory Systems, 1996, vol. 34, pp. 103-108.

- V. Oleshko, **V. Kindratenko**, R. Gijbels, P. Van Espen, W. Jacob, *Study of quasi-fractal many-particle-systems and percolation networks by zero-loss spectroscopic imaging, electron energy-loss spectroscopy and digital image analysis*, Microchimica Acta, 1996, suppl. 13, pp. 444-451.
- **V. Kindratenko**, P. Van Espen, B. Treiger, R. Van Grieken, *Characterisation of the shape of microparticles via fractal and Fourier analyses of their SEM images*, Microchimica Acta, 1996, suppl. 13, pp. 355-361.
- **V. Kindratenko**, P. Van Espen, B. Treiger, R. Van Grieken, *Fractal dimensional classification of aerosol particles by computer-controlled scanning electron microscopy*¹, Environmental Science and Technology, 1994, vol. 28, pp. 2197-2202.

Conference and workshop proceedings

- G. Shi, R. Babich, M. Clark, B. Joo, S. Gottlieb, **V. Kindratenko**, *The Fat-Link Computation On Large GPU Clusters for Lattice QCD*, In Proc. Symposium on Application Accelerators in High-Performance Computing (SAAHPC), 2012.
- G. Shi, **V. Kindratenko**, R. Kooper, P. Bajcsy, *GPU Acceleration of an Image Characterization Algorithm for Document Similarity Analysis*, In Proc. 9th ACS/IEEE International Conference on Computer Systems and Applications (AICCSA), 2011, pp. 209-216.
- D. Ye, A. Titov, **V. Kindratenko**, I. Ufimtsev, T. Martinez, *Porting Optimized GPU Kernels to a Multi-core CPU: Computational Quantum Chemistry Application Example*, In Proc. Symposium on Application Accelerators in High-Performance Computing (SAAHPC), 2011, pp. 73-75.
- G. Shi, S. Gottlieb, A. Torok, **V. Kindratenko**, *Design of MILC lattice QCD application for GPU clusters*, in Proc. IEEE International Parallel and Distributed Processing Symposium (IPDPS), 2011.
- S. Gottlieb, G. Shi, A. Torok, **V. Kindratenko**, *QUDA programming for staggered quarks*, In Proc. The XXVIII International Symposium on Lattice Field Theory (Lattice), 2010.
- A. Torok, S. Basak, A. Bazavov, C. Bernard, C. DeTar, E. Freeland, W. Freeman, S. Gottlieb, U. Heller, J.E. Hetrick, **V. Kindratenko**, J. Laiho, L. Levkova, M. Oktay, J. Osborn, G. Shi, R. Sugar, D. Toussaint, R.S. Van de Water, *Electromagnetic splitting of charged and neutral mesons*, In Proc. The XXVIII International Symposium on Lattice Field Theory (Lattice), 2010.
- J. Enos, C. Steffen, J. Fullop, M. Showerman, G. Shi, K. Esler, **V. Kindratenko**, J. Stone, J. Phillips, *Quantifying the Impact of GPUs on Performance and Energy Efficiency in HPC Clusters*, In Proc. Work in Progress in Green Computing, 2010.
- G. Shi, S. Gottlieb, A. Totok, **V. Kindratenko**, *Accelerating Quantum Chromodynamics Calculations with GPUs*, In Proc. Symposium on Application Accelerators in High-Performance Computing (SAAHPC), 2010.
- A. Titov, **V. Kindratenko**, I. Ufimtsev, T. Martinez, *Generation of Kernels to Calculate Electron Repulsion Integrals of High Angular Momentum Functions on GPUs – Preliminary Results*, In Proc. Symposium on Application Accelerators in High-Performance Computing (SAAHPC), 2010.
- G. Shi, I. Ufimtsev, **V. Kindratenko**, T. Martinez, *Direct Self-Consistent Field Computations on GPU Clusters*, In Proc. IEEE International Parallel and Distributed Processing Symposium (IPDPS), 2010.
- **V. Kindratenko**, J. Enos, G. Shi, M. Showerman, G. Arnold, J. Stone, J. Phillips, W. Hwu, *GPU Clusters for High-Performance Computing*, in Proc. IEEE International Conference on Cluster Computing, Workshop on Parallel Programming on Accelerator Clusters, 2009.

¹ This article was featured by *Analytical Chemistry* magazine (Vol. 66, No. 24, December 15, 1994) under Analytical Currents: Synopses of significant analytical articles from other publications – Spectroscopy.

- R. Cavis, **V. Kindratenko**, S. Tipei, *SoundMaker: a Web-based Teaching Tool for Sound Design*, in Proc. 2009 International Computer Music Conference (ICMC), 2009.
- G. Shi, J. Enos, M. Showerman, **V. Kindratenko**, *On testing GPU memory for hard and soft errors*, in Proc. Symposium on Application Accelerators in High-Performance Computing (SAAHPC), 2009.
- K. Huang, **V. Kindratenko**, Rizwan-uddin, *GPU-Based Parallel Computing: A New Computational Approach and its Applications to Nuclear Engineering*, in Proc. American Nuclear Society 2009 Annual Meeting, 2009, vol. 100, pp. 319-321.
- **V. Kindratenko**, R. Brunner, *Accelerating Cosmological Data Analysis with FPGAs*, In Proc. IEEE Symposium on Field-Programmable Custom Computing Machines(FCCM), 2009, pp. 11-18.
- D. Roeh, **V. Kindratenko**, R. Brunner, *Accelerating Cosmological Data Analysis with Graphics Processors*, In Proc. 2nd Workshop on General-Purpose Computation on Graphics Processing Units (GPGPU-2), 2009, pp. 1-8.
- M. Showerman, J. Enos, A. Pant, **V. Kindratenko**, C. Steffen, R. Pennington, W. Hwu, *QP: A Heterogeneous Multi-Accelerator Cluster*, In Proc. 10th LCI International Conference on High-Performance Clustered Computing (LCI), 2009.
- A. Pant, H. Jafri, **V. Kindratenko**, *Phoenix: A Runtime Environment for High Performance Computing on Chip Multiprocessors*, In Proc. 17th Euromicro International Conference on Parallel, Distributed and Network-Based Processing (PDP), 2009, pp. 119-126.
- G. Shi, **V. Kindratenko**, S. Gottlieb, *Cell processor implementation of a MILC lattice QCD application*, In Proc. The XXVI International Symposium on Lattice Field Theory (Lattice), 2008.
- S. Lee, D. Raila, **V. Kindratenko**, *LLVM-CHiMPS: compilation environment for FPGAs using LLVM compiler infrastructure and CHiMPS computational model*, In Proc. 4th Annual Reconfigurable Systems Summer Institute (RSSI), 2008.
- **V. Kindratenko**, I. Ufimtsev, T. Martínez, *Evaluation of two-electron repulsion integrals over Gaussian basis functions on SRC-6 reconfigurable computer*, In Proc. 4th Annual Reconfigurable Systems Summer Institute (RSSI), 2008.
- G. Shi, **V. Kindratenko**, *Implementation of NAMD molecular dynamics non-bonded force-field on the Cell Broadband Engine processor*, In Proc. 9th IEEE International Workshop on Parallel and Distributed Scientific and Engineering Computing (PDSEC), 2008.
- **V. Kindratenko**, R. Brunner, A. Myers, *Dynamic load-balancing on multi-FPGA systems: a case study*, In Proc. 3rd Annual Reconfigurable Systems Summer Institute (RSSI), 2007.
- B. Hayes, R. Brunner, **V. Kindratenko**, *Angular Power Spectrum Estimation using High Performance Reconfigurable Computing*, In Proc. 3rd Annual Reconfigurable Systems Summer Institute (RSSI), 2007.
- R. Brunner, **V. Kindratenko**, and A. Myers, *Developing and Deploying Advanced Algorithms to Novel Supercomputing Hardware*, in Proc. NASA Science Technology Conference (NSTC), 2007.
- **V. Kindratenko**, R. Brunner, A. Myers, *Mittrion-C Application Development on SGI Altix 350/RC100*, In Proc. IEEE Symposium on Field-Programmable Custom Computing Machines (FCCM), 2007.
- D. Meixner, **V. Kindratenko**, D. Pointer, *On Using Simulink to Program SRC-6 Reconfigurable Computer*, in Proc. Military and Aerospace Programmable Logic Device (MAPLD), 2006.
- D. Meixner, **V. Kindratenko**, D. Pointer, *Running Simulink-based Designs on SRC-6*, in Proc. High Performance Embedded Computing (HPEC), 2006, pp. 45-46.

- **V. Kindratenko**, *Code partitioning for reconfigurable high-performance computing: a case study*, in Proc. Engineering of Reconfigurable Systems and Algorithms (ERSA), 2006, pp. 143-149.
- **V. Kindratenko**, and D. Pointer, *A case study in porting a production scientific supercomputing application to a reconfigurable computer*, in Proc. IEEE Symposium on Field-Programmable Custom Computing Machines (FCCM), 2006, pp. 13-22.
- M. Hall, A. Betts, D. Cox, D. Pointer, and **V. Kindratenko**, *The Visible Radio: process visualization of a software-defined radio*, in Proc. IEEE Visualization, 2005, pp. 159-165.
- Betts, M. Hall, **V. Kindratenko**, M. Pant, D. Pointer, V. Welch, and P. Zawada, *The GNU software radio transceiver platform*, in Proc. Software Defined Radio Technical Conference, 2004, Vol. C, pp. 41-46.
- D. Pointer, **V. Kindratenko**, P. Zawada, and M. Pant, *The extensible sensor platform*, in Proc. Software Defined Radio Technical Conference, 2004, Vol. A, pp. 201-205.
- R. Hornbaker, **V. Kindratenko**, and D. Pointer, *An RFID agricultural product and food security tracking system using GPS and wireless technologies*, in Proc. 7th International Conference on Precision Agriculture and Other Precision Resources Management, 2004, CD-ROM, paper # 212.
- R. Hornbaker, A. Hansen, **V. Kindratenko**, D. Pointer, and A. Apgar, *Improving agricultural operational efficiency with wireless communication*, in Proc. 7th International Conference on Precision Agriculture and Other Precision Resources Management, 2004, CD-ROM, paper #209.
- D. Cox, **V. Kindratenko**, and D. Pointer, *IntelliBadge™: towards providing location-aware value-added services at academic conferences*, in Proc. 5th International Conference on Ubiquitous Computing - UbiComp 2003, Lecture Notes in Computer Science series, 2003, vol. 2864, pp. 264-280.
- D. Cox, **V. Kindratenko**, D. Pointer, *IntelliBadge™*, in Proc. 1st International Workshop on Ubiquitous Systems for Supporting Social Interaction and Face-to-Face Communication in Public Spaces, UbiComp 2003 Adjunct proceedings, 2003, pp. 41-47.
- J. Ghaboussi, Y. Hashash, and **V. Kindratenko**, *Real-time soil modeling for machine-medium interaction in virtual reality*, in Proc. 8th International Symposium on Numerical Models in Geomechanics - NUMOG VIII, Swets & Zeitlinger, Lisse, The Netherlands, 2002, pp. 207-212.
- **V. Kindratenko**, *Intelligent Automated Motion Imagery Acquisition*, in Proc. Defining a Motion Imagery Research and Development Program Workshop, 2001, CD-ROM.
- **V. Kindratenko**, *Computer vision guided cross-projector color alignment on multi-projector displays*, in Proc. 4th International Immersive Projection Technology Workshop, 2000, CD-ROM.
- **V. Kindratenko**, and A. Bennett, *Evaluation of rotation correction techniques for electromagnetic position tracking systems*, in Proc. 6th Eurographics Workshop - Virtual Environments 2000, Springer Computer Science Series, Springer-Verlag, Berlin, Germany, 2000, pp. 13-22.
- **V. Kindratenko**, and B. Kirsch, *Sharing virtual environments over a Transatlantic ATM network in support of distant collaboration in vehicle design*, in Proc. 4th Eurographics Workshop - Virtual Environments '98, Springer Computer Science Series, Springer-Verlag, Berlin, Germany, 1998, pp. 151-161.
- **V. Kindratenko** and P. Van Espen, *Classification of irregularly shaped micro-objects using complex Fourier descriptors*, in Proc. 13th International Conference on Pattern Recognition - ICPR'96, IEEE Computer Society Press, Los Alamitos, California, vol. 2, pp. 285-289.
- **V. Kindratenko**, B. Treiger, and P. Van Espen, *Binarization of inhomogeneously illuminated images*, in Proc. 8th International Conference on Image Analysis and Processing - ICIAP'95, Lecture Notes in Computer Science series, 1995, vol. 974, pp. 483-487.

Other publications

- **V. Kindratenko**, G. Peterson, *Application accelerators in HPC*, Editorial introduction, Parallel Computing, vol. 38, no. 8, p. 343, 2012.
- **V. Kindratenko**, *Scientific Computing with GPUs*, Guest Editors' Introduction, IEEE/AIF Computing in Science and Engineering, vol. 14, no. 3, 2012.
- **V. Kindratenko**, P. Trancoso, Trends in High-Performance Computing, *Novel Architectures* department article, IEEE/AIF Computing in Science and Engineering, vol. 13, No. 3, pp. 92-95, 2011.
- D. Bader, D. Kaeli, **V. Kindratenko**, *Special Issue on High-Performance Computing with Accelerators*, Guest Editor's Introduction, IEEE Transactions on Parallel and Distributed Systems, vol. 22, no. 1, pp. 3-6, 2011.
- **V. Kindratenko**, R. Wilhelmson, R. Brunner, T. Martinez, W. Hwu, *High-Performance Computing with Accelerators*, Guest Editors' Introduction, IEEE/AIF Computing in Science and Engineering, vol. 12, no. 4, pp. 12-16, 2010.
- G. Shi, **V. Kindratenko**, F. Pratas, P. Trancoso, M. Gshwind, Application Acceleration with the Cell Broadband Engine, *Novel Architectures* department article, IEEE/AIF Computing in Science and Engineering, vol. 12, No. 1, pp. 76-81, 2010.
- **V. Kindratenko**, *Novel Computing Architectures*, inaugural *Novel Architectures* department article, IEEE/AIF Computing in Science and Engineering, vol. 11, no. 3, pp. 54-57, 2009.
- **V. Kindratenko**, G. Thiruvathukal, S. Gottlieb, *High-Performance Computing Applications on Novel Architectures*, Guest Editors' Introduction, IEEE/AIF Computing in Science and Engineering, vol. 10, no. 6, pp. 13-15, 2008.
- **V. Kindratenko**, D. Buell, *Reconfigurable Systems Summer Institute 2007*, Guest Editorial, Parallel Computing, vol. 34, no. 4-5, pp. 199-200, 2008.
- **V. Kindratenko**, C. Steffen, R. Brunner, *Accelerating scientific applications with reconfigurable computing*, invited *Scientific Programming* department article, IEEE/AIF Computing in Science and Engineering, vol. 9, no. 5, pp. 70-77, 2007.
- D. Buell, T. El-Ghazawi, K. Gaj, **V. Kindratenko**, *High-Performance Reconfigurable Computing*, Guest Editors' Introduction, IEEE Computer, vol. 40, no. 3, pp. 27-31, 2007.

Edited volumes

- *Proceedings of the 1st international workshop on High-performance reconfigurable computing technology and applications* (held in conjunction with SC07), ACM Press, ISBN 978-1-59593-894-7, 2007.
- *Proceedings of the 2st international workshop on High-performance reconfigurable computing technology and applications* (held in conjunction with SC08), IEEE Publishing, ISBN 978-1-4244-2826-7, 2008.
- *Proceedings of the 3rd international workshop on High-performance reconfigurable computing technology and applications* (held in conjunction with SC09), ACM Press, ISBN 978-1-60558-721-9, 2009.
- *Proceedings of the 4th international workshop on High-performance reconfigurable computing technology and applications* (held in conjunction with SC10), IEEE Publishing, ISBN 978-1-4244-9517-7, 2010.

- *Proceedings of the 2011 Symposium on Application Accelerators in High-Performance Computing (SAAHPC)*, IEEE Publishing, ISBN 978-0-7695-4448-9, 2011.
- Shi, Xuan; Kindratenko, Volodymyr; Yang, Chaowei (Eds.), *Modern Accelerator Technologies for Geographic Information Science*, Springer, ISBN 978-1-4614-8744-9, 2013.

Professional Service

Journal editorial duties

- **Department Editor**, *IEEE/AIF Computing in Science and Engineering*, Novel Architectures department, 2009-present
- **Associate Editor**, *International Journal of Reconfigurable Computing (IJRC)*, 2007-present
- **Guest Editor**, *IEEE Transactions on Parallel and Distributed Systems (TPDS)*, Special Issue on High-Performance Computing with Accelerators, 2011
- **Guest Editor**, *ACM Transactions on Reconfigurable Technology and Systems (TRETs)*, Proceedings of HPRCTA'08 Special Issue, 2009; Proceedings of RSSI'08 Special Issue, 2009; Proceedings of HPRCTA'07 Special Issue, 2008
- **Guest Editor**, *IEEE/AIF Computing in Science and Engineering*, Special Issue on the High-Performance Computing Applications on Novel Architectures, 2008; Special Issue on High-Performance Computing with Accelerators, 2010; Special Issue on Scientific Computing with GPUs, 2012.
- **Guest Editor**, *Parallel Computing*, Proceedings of RSSI'07 Special Issue, 2007; Application accelerators in HPC Special Issue, 2011
- **Guest Editor**, *IEEE Computer*, Special Issue on High-Performance Reconfigurable Computing, 2007

Conference and symposia leadership

- **Co-chair**, 2012 International Workshop on Modern Accelerator Technologies for GIScience, 2012
- **Program Chair**, Symposium on Application Accelerators in High Performance Computing (SAAHPC), 2009-2011; **event co-founder**
- **Workshop co-Chair**, *Path to Petascale: Adapting GEO/CHEM/ASTRO Applications for Accelerators and Accelerator Clusters*, Urbana (IL), April 2009
- **Program co-Chair**, High Performance Reconfigurable Computing track, *2008 International Conference on Reconfigurable Computing and FPGAs (ReConFig)*, Cancun, Mexico, November 2008
- **Program co-Chair**, Reconfigurable Computing track, *51st IEEE International Midwest Symposium on Circuits and Systems (MWSCAS)*, Knoxville (TN), August 2008
- **Program Chair**, *Workshop on Programming Massively Parallel Processors (PMPP)*, Urbana (IL), July 2008
- **Program Chair**, *Reconfigurable Systems Summer Institute (RSSI)*, Urbana (IL), July 2008, 2007, 2006
- **Workshop Chair**, *International Workshop on High-Performance Reconfigurable Computing Technology and Applications (HPRCTA)*, in conjunction with *IEEE/ACM Supercomputing*, New Orleans (LA), November 2010; Portland (OR), November 2009; Austin (TX), November 2008; Reno (NV), November 2007; also **event co-founder**
- **Panel organizer (at IEEE/ACM Supercomputing)**
 - Can Developing Applications for Massively Parallel Systems with Heterogeneous Processors Be Made Easy(er)?, *IEEE/ACM Supercomputing*, Austin (TX), November 2008

- (Super)computing on FPGAs, GPUs, Cell and Other Exotic Architectures: Challenges and Opportunities, *IEEE/ACM Supercomputing*, Reno (NV), November 2007
- Is High-Performance, Reconfigurable Computing the Next Supercomputing Paradigm?, *IEEE/ACM Supercomputing*, Tampa Bay (FL), November 2006
- **Workshop co-Chair**, Second International Workshop on Ubiquitous Systems for Supporting Social Interaction and Face-to-Face Communication in Public Spaces, *UbiComp'04*, Nottingham, England, September 2004; First International Workshop on Ubiquitous Systems for Supporting Social Interaction and Face-to-Face Communication in Public Spaces, *UbiComp'03*, Seattle (WA), October 2003

Peer reviews

- **Journal paper reviews**

- *Microprocessors and Microsystems* (2013), *International Journal of Parallel Programming* (2013), *Journal of Signal Processing Systems* (2013), *IEEE Transactions on Robotics* (2011-2012), *Journal of Parallel and Distributed Computing* (2010-2011), *Geoinformatica* (2011), *International Journal of Computer Assisted Radiology and Surgery* (2013), *International Journal of Computers and Applications* (2008, 2010), *ACM Transactions on Embedded Computing Systems* (2008-2010), *EURASIP Journal on Embedded Systems* (2008), *IEEE Transactions on Computers* (2008-2009, 2011), *ACM Transactions on Reconfigurable Technology and Systems* (2008-2010), *IEEE/AIF Computing in Science and Engineering* (2008-2013), *Parallel Computing* (2008, 2010-2013), *IEEE Transactions on Parallel and Distributed Systems* (2007, 2009-2010), *IEEE Transactions on Very Large Scale Integration Systems* (2006), *IEEE Computer* (2006-2007)
- *Virtual Reality* (2006), *Image and Vision Computing* (2004), *International Journal of Remote Sensing* (2004), *Journal of Systemics, Cybernetics and Informatics* (2003), *Virtual Reality: Research, Development, and Applications* (2002), *Journal of Mathematical Imaging and Vision* (2002), *Micron: The International Research Review Journal for Microscopy* (1999), *IEEE Communications Letters* (1998)

- **Conference/workshop Technical Program Committees**

- *IEEE International Parallel and Distributed Processing Symposium* (IPDPS 2013); *IEEE International Conference on Application-specific Systems, Architectures and Processors* (ASAP 2013); *International Workshop on Frontiers of Heterogeneous Computing* (FHC 2013); *Euromicro International Conference on Parallel, Distributed and Network-Based Computing* (PDP 2012-2013); *IEEE International Conference on Intelligent Data Acquisition and Advanced Computing Systems: Technology and Applications* (IDAACS 2013); *IFIP International Conference on Network and Parallel Computing* (NPC 2013); *IEEE/ACM International Symposium on Cluster, Cloud, and Grid Computing* (CCGrid 2012); *International Conference on High Performance Computing* (HPC-UA 2012-2013); *Cluster Computing* (regional conference in Ukraine 2012-2013); *ACM International Conference on Computing Frontiers* (CF 2011); *ACS/IEEE International Conference on Computer Systems and Applications* (AICCSA 2011); *Workshop on General-Purpose Computation on Graphics Processing Units* (GPGPU 2010-2012); *International Workshop on Frontier of GPU Computing* (FGC 2010-2012); *Many-Core and Reconfigurable Supercomputing Conference* (MRSC 2009-2011); *HiPEAC Workshop on Reconfigurable Computing* (WRC 2009-2011); *International Conference on Reconfigurable Computing and FPGAs* (ReConFig 2008-2012); *International Conference on Engineering of Reconfigurable Systems and Algorithms* (ERSA 2007-2010); *International Conference on Field-Programmable Technology* (FPT 2008-2010)

- **Conference/workshop paper reviewer**

- *International Conference on Field-Programmable Technology (ICFPT 2008); IEEE International Midwest Symposium on Circuits and Systems (MWSCAS 2008); IEEE/ACM Supercomputing (2006); International Conference on Computing, Communications and Control Technologies (2005); IEEE Visualization Conference (2001- 2002)*
- **Other conference committees**
 - Emerging Technology Committee, *IEEE/ACM Supercomputing conference*, November 2014
 - Doctoral Showcase Chair, *IEEE/ACM Supercomputing conference*, Seattle (WA), November 2011
 - International committee, *ACM SIGGRAPH*, Boston (MA), August 2006
 - Emerging Technologies jury and International Committee, *ACM SIGGRAPH*, Los Angeles (CA), August 2005
 - Sub-committee, *IEEE/ACM Supercomputing*, Baltimore (MD), November 2002
- **Agency proposal reviews and panels**
 - **NSF** (2008-2009, 2011-2013)
 - **NASA** (2007-2008)
 - *Research Grants Council of Hong Kong* (2011-2012)
 - *Israel Science Foundation* (2005)
- **Executive/Advisory boards/Consulting**
 - Academic At-Large Board member, *OpenFPGA Board of Directors*, 2009-present
 - Technology Consultant to *Aries Automation*, 2010-present
 - Advisory board member, *NIST: Structural Health Integrated Electronic Life Determination (SHIELD)* (2003-2005)

Other

- **Tutorials**
 - Introduction to GPU Programming, *The 9th ACS/IEEE International Conference on Computer Systems and Applications*, Egypt, December 2011
 - Introduction to GPU Programming, *High Performance Computing Course*, Advanced Digital Sciences Center, Singapore, July 2011
 - Introduction to GPU Programming, *US-Egypt Collaboration Follow-up meeting*, The American University in Cairo, Egypt, December 2010
 - Introduction to GPU Programming, *High Performance Computing Course*, Advanced Digital Sciences Center, Singapore, June 2010
 - Introduction to GPU Programming, *CRA-W/CDC Careers in High Performance Systems (CHiPS) Mentoring Workshop*, Urbana (IL), July 2009
 - Reconfigurable Computing tutorial, *Reconfigurable Systems Summer Institute*, Urbana (IL), July 2008
 - Reconfigurable Supercomputing tutorial, *IEEE/ACM Supercomputing*, Reno (NV), November 2007; Tampa Bay (FL), November 2006
- **Panels**
 - Panel: *Battle of the Accelerator Stars* at the *Fifth International Workshop on Parallel Programming Models and Systems Software for High-End Computing (P2S2)* held in conjunction with the *41st International Conference on Parallel Processing (ICPP)*, Pittsburg (PA), September

2012

- BoF: *Application Grand Challenges in the Heterogeneous Accelerator Era*, IEEE/ACM Supercomputing, Seattle (WA), November 2011
- Panel: *Key Challenges presented by next generation hardware system*, Key Challenges in Modeling and Simulation Fall Creek Falls conference, Nashville (TN), September 2007
- BoF: *Programming FPGAs: Challenges and Successes*, IEEE/ACM Supercomputing, Tampa Bay (FL), November 2006
- **Invited presentations**
 - *Technologies for desktop HPC: Application developer's perspective*, 240th ACS National Meeting & Exposition, August 2010, Boston (MA)
 - *Overview of Hardware Accelerators*, NSF US/Egypt Meeting on Software Development for Multicore and Heterogeneous Processing Technologies, June 2009, Cairo, Egypt
 - *High Performance Computing with Accelerators*, First workshop of the Joint Laboratory for Petascale Computing, June 2009, Paris, France
 - *Accelerating Cosmology Applications: from 80 Mflops to 8 Gflops in 4 Steps*, Revolutionary Technologies for Acceleration of Emerging Petascale Applications – FPGAs Minisymposia, 13th SIAM Conference on Parallel Processing for Scientific Computing, Atlanta (GA), March 2008
 - *Tracker Calibration Techniques*, Advanced CAVE Programming Workshop Series, Norfolk (VA), October 2000, Ann Arbor (MI), August 2000
 - *Application Case Study III: Distributed Virtual Reality System*, NLNR Distributed Computing Workshop Series, Urbana-Champaign (IL), August 1998, Urbana-Champaign (IL), March 1998
 - *Distributed Virtual Reality*, Advanced Internet Applications Panel, University of Pennsylvania, Philadelphia (PA), May 1998

Patents

- R. Hornbaker, **V. Kindratenko**, and D. Pointer, *System for tracking grain*, [US Patent 7,511,618 B2](#), March 31, 2009.
- R. Hornbaker, **V. Kindratenko**, and D. Pointer, *Tracking device for grain*, [US Patent 7,162,328](#), January 9, 2007.
- R. Hornbaker, **V. Kindratenko**, and D. Pointer, *Method for tracking grain*, [US Patent 7,047,103](#), May 16, 2006.
- **V. Kindratenko** and R. Fenwick, *System and method for hidden object removal*, [US Patent 6,897,863](#), May 24, 2005.
- **V. Kindratenko** and R. Fenwick, *Cuts removal system for triangulated CAD models*, [US Patent 6,744,434](#), June 1, 2004.

Professional Membership

- Senior Member, **The Institute of Electrical and Electronics Engineers (IEEE)**
- Senior Member, **The Association for Computing (ACM)**