

Dmitri A. Gusev

Address: Department of Computer Science
Central Connecticut State University
1615 Stanley Street
New Britain, CT 06050
Phone: (585) 957-2050 (cell)
Email: gusevdma@ccsu.edu
Home page: <http://www.cs.ccsu.edu/~gusev/>

CURRICULUM VITAE

OBJECTIVE: To obtain a tenure-track faculty position in Computer Science.

QUALIFICATIONS

Assistant professor of Computer Science; taught Computer Science before as an adjunct assistant professor, visiting lecturer, and associate instructor. Innovative color and imaging scientist with over 15 years of U.S. and international industrial and academic experience in algorithm design, implementation, research and solution development for

- image processing and graphics:
 - digital halftoning,
 - color management,
 - image compression,
 - image filtering,
 - medical imaging;
- scientific visualization:
 - historical data visualization in GIS,
 - visualization of spectra;
- color science:
 - image quality,
 - image analysis;
- signal processing;
- pattern recognition,
 - including OCR;
- analysis of algorithms;
 - my new area of interest is phylogenetic algorithms in linguistics.

Problem solver with outstanding analytical skills and extensive programming experience (C++, Java, Matlab, C, etc.); enthusiastic team player; color expert with strong mathematical background. Proven track record in imaging science and engineering demonstrated by numerous publications and 7 patent applications.

EDUCATION

Ph.D.	June 1999	Indiana University, Bloomington	Computer Science
M.S.	May 1996	Indiana University, Bloomington	Computer Science
Honours Diploma	February 1993	Moscow Institute of Radioengineering, Electronics, and Automation	Applied Mathematics

EMPLOYMENT

August 2007 – present

Assistant professor,

Department of Computer Science,
Central Connecticut State University

Responsibilities: Teach Computer Science courses on the undergraduate and graduate level, including an introductory course for non-majors.

August 1999 – May 2007

Image processing scientist,

Eastman Kodak Company, Rochester, NY
(NexPress Solutions in 1999-2006)

Responsibilities: Designed screen sets for 4-color and 5-color digital halftoning and algorithms for their generation. Developed color management solutions for 4-color and 5-color digital electrophotographic (EP) printing. Developed image quality metrics for color rendition. Supported competitive benchmarking of color management tools, digital presses, and colorimetric equipment. Developed image compression solutions for fast transmission and compact storage of raster data (2000-2001).

August 2006 – May 2007

Adjunct assistant professor,

Department of Computer Science,
SUNY Brockport

Responsibilities: Taught CSC 120: Introduction to Computer Science. This course introduced problem solving and computers for prospective computer science majors or minors. It included data representation, algorithms and their properties, assembly language concepts, and elementary Java programming.

August 1998 – May 1999

Visiting lecturer,

Mathematics and Computer Science Department,
Indiana University South Bend

Responsibilities: Taught A106 "Introduction to Computing" and C101 "Computer Programming" (C++).

January 1994 – August 1998

Associate instructor, research assistant,

Computer Science Department, Indiana University,
Bloomington

Responsibilities: Assisted faculty with their teaching and research. Taught C335 "Computer Structures" (Summer 1998).

April 1993 – November 1993

Engineer-mathematician,

Institute of System Analysis, Russian Academy of
Sciences, Moscow, Russia

Responsibilities: Algorithm development for optical character recognition (OCR) and form recognition.

Summer 1989

Programmer, Electromechanics Research Institute,
Moscow, Russia

Responsibilities: Development of Ada packages for matrix and vector computations, fast prime number sieve.

August 1986 – August 1987

Computer operator, Design Bureau of CAD Systems
for Textile Industry, Moscow, Russia

PUBLICATIONS

1. Yee S. Ng, Hwai Tai, Chung-hui Kuo and Dmitri Gusev, **Advances in NexPress Digital Printing Technology**, NIP23: The 23rd International Conference on Digital Printing Technologies, Anchorage, Alaska (Sep. 16-21, 2007) pp. 489-493, http://www.cs.ccsu.edu/~gusev/ImProc/Gusev_NIP23.pdf
2. Lyudmila M. Filatova, Dmitri A. Gusev and Sergey K. Stafeyev, **Iterative Reconstruction of Ptolemy's West Africa Using a GIS**, submitted for publication. An early version of this article can be accessed at <http://www.cs.ccsu.edu/~gusev/SciVis/PtolemyWestAfricaReconstructed.pdf>
3. T. Bouk, E. N. Dalal, K. D. Donohue, S. Farnand, F. Gaykema, D. Gusev, A. Haley, P. L. Jeran, D. Kozak, W. C. Kress, Ó. Martinez, D. Mashtare, A. L. McCarthy, Y. S. Ng, D. R. Rasmussen, M. Robb, H. Shin, M. Q. Slickers, E. H. Barney-Smith, M. Tse, E. K. Zeise, S. Zoltner, **Recent Progress in the Development of INCITS W1.1: Appearance-Based Image Quality Standards for Printers**, Electronic Imaging 2007, San Jose, CA (Jan. 28 – Feb. 1, 2007).
4. S. Farnand, F. Gaykema, W. Kress, Ó. Martinez, A. McCarthy, H. Shin, E. Zeise, and D. Gusev, **Update on the INCITS W1.1 Standard for Evaluating the Color Rendition of Printing Systems**, Electronic Imaging 2006, San Jose, CA (Jan. 15-19, 2006), http://www.cs.ccsu.edu/~gusev/ColSci/Gusev_IQSP2006.pdf
5. D. A. Gusev, S. K. Stafeyev, L. M. Filatova, **Iterative Reconstruction of Ptolemy's West Africa**, The 10th International Conference on the Problems of Civilization, Moscow, Russia (May 21-22, 2005) [in Russian]. This work was also presented in English at the GIS Seminar, Rochester Institute of Technology, Oct. 31, 2006.
6. S. Farnand, K. Töpfer, W. Kress, Ó. Martinez, A. McCarthy, H. Shin, E. Zeise, and D. Gusev, **Update on the INCITS W1.1 Standard for Evaluating the Color Rendition of Printing Systems**, Electronic Imaging 2005, San Jose, CA (Jan. 16-20, 2005), pp. 157-162, http://www.cs.ccsu.edu/~gusev/ColSci/Gusev_IQSP2005.pdf
7. R. Cookingham, S. Farnand, K. Töpfer, E. Dalal, A. McCarthy, W. Kress, Ó. Martinez, E. Zeise, and D. Gusev, **Update on the INCITS W1.1 Standard for Evaluating the Color Rendition of Printing Systems**, Electronic Imaging 2004, San Jose, CA (Jan. 18-22, 2004) pp. 55-59.
8. Chunghui Kuo, Yee Ng, and Dmitri A. Gusev, **Perceptual Color Contouring Detection and Quality Evaluation Using Scanners**, IS&T's NIP19: 2003 International Conference on Digital Printing Technologies, New Orleans, LA (Sep. 28 – Oct. 3, 2003) pp. 581-585. The abstract of this paper is available at <http://www.imaging.org/store/epub.cfm?abstrid=22069>
9. Dmitri A. Gusev, **Color Gamut Characterization via Ray Tracing for Device Profile Generation**, IS&T's PICS 2003: The Digital Photography Conference, Rochester, NY (May 3-16, 2003) pp. 408-412, http://www.cs.ccsu.edu/~gusev/ImProc/Gusev_PICS2003.pdf
10. Dmitri A. Gusev, **Digital Halftoning Algorithms for Medical Imaging**, in: C. T. Leondes (Ed.), Computational Methods in Biophysics, Biomaterials, Biotechnology and Medical Systems, Vol. I: Algorithm Techniques, Kluwer Academic Publishers, Boston, MA (2003) pp. 127-191 (invited book chapter).
11. Dmitri A. Gusev, **Anti-Correlation Digital Halftoning**, Ph.D. thesis, Computer Science Department, Indiana University, Bloomington (1999), http://www.cs.ccsu.edu/~gusev/ImProc/DmitriGusev_PhD-Thesis.pdf

12. Dmitri A. Gusev, **Anti-Correlation Digital Halftoning by Generalized Russian Roulette**, IS&T's PICS '99: The 53rd Annual Conference on Image Processing, Image Quality, Image Capture Systems, Savannah, GA (Apr. 25-28, 1999) pp. 327-332.
13. Eugene A. Sandler, Dmitri A. Gusev, Gregory Y. Milman, and Mikhail L. Podolsky, **Estimating from Outputs of Oversampled Delta-Sigma Modulation**, Signal Processing, Vol. 59, No. 3 (1997) pp. 305-311.
14. Eugene A. Sandler, Dmitri A. Gusev, Gregory Y. Milman, **Hybrid Algorithms for Digital Halftoning and Their Application to Medical Imaging**, Computers & Graphics, Vol. 21, No. 1, 6 (1997) pp. 69-78, 859 (erratum).
15. Eugene A. Sandler, Gregory Y. Milman, Dmitri A. Gusev, **New Methods for Computer-Aided High-Quality Printing of Halftone Images**, Proceedings of the International Exhibition-Seminar COGRAPH-93 (Computational Geometry and Computer Graphics in Education), Nizhni Novgorod State University of Technology, Nizhni Novgorod (1993) p. 48 [in Russian].
16. Dmitri A. Gusev, **Mathematical Support for Solving Problems of Halftone Image Visualization and Printing**, Thesis, Moscow Institute of Radioengineering, Electronics, and Automation, Moscow (1993) [in Russian].
17. Dmitri A. Gusev, Gregory Y. Milman, Eugene A. Sandler, **Principles of Optimal Rasters Application to Pattern Recognition Problems**, in: N. N. Evtikhiev (Ed.), Voprosy Kibernetiki, Ustroystva i Sistemy (MIREA Transactions), Moscow Institute of Radioengineering, Electronics, and Automation, Moscow (1992) pp. 18-29 [in Russian].
18. Dmitri A. Gusev, Gregory Y. Milman, Eugene A. Sandler, **Delta-Sigma Modulation Devices Transforming Signal and Image Gradations**, in: N. N. Evtikhiev (Ed.), Voprosy Kibernetiki, Ustroystva i Sistemy (MIREA Transactions), Moscow Institute of Radioengineering, Electronics, and Automation, Moscow (1992) pp. 13-17 [in Russian].

TECHNICAL REPORTS

I authored and co-authored 2 technical reports in 2001, while working for NexPress Solutions, and 4 technical reports in 1996-1998 at Indiana University, Bloomington. Sample technical report:

G. Neil Haven and Dmitri A. Gusev, **On First-Order Two-Dimensional Linear Homogeneous Partial Difference Equations**, TR No. 448, Computer Science Department, Indiana University, Bloomington, January 1996, http://www.cs.ccsu.edu/~gusev/AlgLin/Gusev_TR448.pdf

PATENT APPLICATIONS

The following patent applications (6 out of 7) have been published at the Web site of the U.S. Patent and Trademark Office, <http://www.uspto.gov/patft/index.html>:

1. Hwai-Tzoo Tai, Chung-Hui Kuo, Dmitri A. Gusev, **Multilevel Halftone Screen and Sets Thereof**, Application #20070236741 (Filed Mar. 31, 2006).
2. Hwai-Tzoo Tai, Chung-Hui Kuo, Dmitri A. Gusev, **Method of Making a Multilevel Halftone Screen**, Application #20070236736 (Filed Mar. 31, 2006).
3. Yee S. Ng, Hwai-Tzoo Tai, Chung-Hui Kuo, Dmitri A. Gusev, **Color Enhancement Method and System**, Application #20070097461 (Filed Oct. 28, 2005).

4. Yee S. Ng, Chung-Hui Kuo, Dmitri A. Gusev, **Color Contour Detection and Correction**, Application #20060072128 (Filed Sep. 27, 2004).
5. Hwai-Tzoo Tai and Dmitri A. Gusev, **Method and Apparatus for Multi-Color Printing Using a Rosette or Diamond Halftone Screen for One or More of the Colors**, Application #20050243340 (Filed Apr. 30, 2004).
6. Hwai-Tzoo Tai and Dmitri A. Gusev, **Method and Apparatus for Multi-Color Printing Using Hybrid Dot-Line Halftone Composite Screens**, Application #20050243344 (Filed Apr. 30, 2004).

PUBLICATIONS ABOUT MY WORK

1. Henry B. Freedman, **Kodak NexPress Digital Color Printing – Offset Quality and Enhanced Screening Technology Create New Market Opportunities**, Technology Watch, Vol. 11 (Fall 2006): “Staccato DX Screening uses the multi-level printing capability of the NexPress’s 600 dpi 8-bits per color image chain. The new screening process has a unique hybrid AM and FM structure consisting of variable dot size, dot shape, dot density, and dot positions. The structure simulates the receptive field structure of the human retina to achieve the desired image smoothness. It has achieved a printing consistency similar to other NexPress screens... One benefit of the NexPress Staccato DX FM Screening technology is an increase in detail over the traditional NexPress Classic screening method.”
2. Christian K. Schowalter (U. of Applied Sciences, Munich, Germany), **Visual Comparison of Screening Quality in Digital Printing Systems**, IS&T’s NIP18: 2002 International Conference on Digital Printing Technologies, San Diego, CA (Sep. 29 – Oct. 4, 2002) pp. 682-686: “...Indigo UltraStream and Xeikon stand usually at the end of the rank order, followed by the newer Xerox, and the recently released NexPress.”

TEACHING EXPERIENCE

- | | |
|-------------|--|
| Spring 2008 | <ul style="list-style-type: none"> ● CS 110 – Introduction to Internet Programming and Applications ● CS 113 – Introduction to Computers ● CS 210 – Computing and Culture |
| Fall 2007 | <ul style="list-style-type: none"> ● CS 113 – Introduction to Computers ● CS 210 – Computing and Culture ● CS 502 – Computing and Communications Technology |
| Spring 2007 | <ul style="list-style-type: none"> ● CSC 120 – Introduction to Computer Science (<i>Java</i>) |
| Fall 2006 | <ul style="list-style-type: none"> ● CSC 120 – Introduction to Computer Science (<i>Java</i>) |
| Spring 1999 | <ul style="list-style-type: none"> ● A106 – Introduction to Computing |
| Fall 1998 | <ul style="list-style-type: none"> ● A106 – Introduction to Computing ● C101 – Computer Programming (<i>C++</i>) |
| Summer 1998 | <ul style="list-style-type: none"> ● C335 – Computer Structures |

Prior to that, I had assisted Prof. Randall Bramley (Scientific Computing) for one semester, Prof. Paul W. Purdom, Jr. (Analysis of Algorithms) for two semesters (taught seminars), and Prof. Jonathan W. Mills (Computer Architecture) for one semester.

SELECTED PROJECTS

1. **The Universe of Ptolemy** (Apr. 2004 – present). The Ptolomey Workgroup is devoted to the Ptolemy reconstruction project initiated by the late L. M. Filatova. My current efforts are focused on localizing the points from Ptolemy's "Geography" situated in or near the modern Tunisia and Libya using a GIS and remote sensing data.
2. **INCITS W1.1 Standard for Evaluating the Color Rendition of Printing Systems** (May 2003 – present). Since May 2003, I have been a member of the INCITS W1.1 workgroup on color rendition. In 2006-2007, I served as the group leader.
3. **Kodak NexPress 2100, 2100 Plus, 2500 and M700 digital color presses, Kodak NexGlosser glossing unit, Kodak NexPress Intelligent Color solution for 5-color printing** (Aug. 1999 – May 2007).
 - Invented a new method and built a software tool for device color gamut characterization and ICC profile generation via ray tracing. Implemented a color management module (CMM) as an integral part of the tool.
 - As part of a team, co-developed progressively improving color management solutions for 4-color and 5-color printing for Kodak's award-winning NexPress digital presses and the NexGlosser glossing unit.
 - Assisted scientists of the School of Print Media at RIT in establishing a substrate qualification program including custom ICC profile generation and verification.
 - Classified Pantone colors and supported Pantone licensing of the presses as a color expert.
 - Designed 3 out of 5 pictorial halftone screen sets for 4-color printing on Kodak NexPress 2100, 2100 Plus, and 2500 digital production color presses: Classic (default), Line, and Supra. As a key member of a small team, extended the screen sets to 5-color printing and co-designed the other 2 screen sets: Optimum and, most recently, Staccato DX. Analyzed and evaluated numerous halftone screening options, including those for the new NexPress M700 digital color press launched in April 2007.
 - Researched advantages of contone and stochastic EP printing of satellite images.
 - Built a software tool for computing geometric parameters of halftone screen sets. Co-developed an algorithm and implemented a software tool for halftone screen generation.
 - Co-invented a method for color contouring detection using scanners.
 - Studied and monitored page-to-page, run-to-run, and engine-to-engine color consistency.
 - Researched and evaluated wavelet based image compression techniques. As part of a large team, co-developed an image compression solution for NexPress 2100.
 - Evaluated performance of multiple color management tools, digital presses, and spectrophotometers as a color expert.

