Vladimir Sukhoy

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I. Educational Background

Iowa State University — Ames, IA
Ph.D. in Computer Engineering and Human Computer Interaction — Dec. 2019

Iowa State University — Ames, IA
M.S. in Applied Mathematics — Dec. 2011

Donetsk National University — Donetsk, Ukraine
Bachelor in Applied Mathematics. GPA 3.97/4.00 — July 2004

II. Research Interests

Artificial Intelligence, Robotics, Signal Processing, Machine Learning,
Human Computer Interaction, Software Engineering, Applied Mathematics

III. Publications and Research Reports

A. Articles in Journals:

6. **Sukhoy, V.** and Stoytchev, A. "Numerical error analysis of the ICZT algorithm for chirp contours on the unit circle," *Scientific Reports*, 10, Article number: 4852, March 17, 2020.
5. **Sukhoy, V.** and Stoytchev, A. "Eliminating the variability of cross-validation results with LIBLINEAR due to randomization and parallelization," *ReScience C*, 5(3), Article number: 1, November 4, 2019.
4. **Sukhoy, V.** and Stoytchev, A. "Generalizing the inverse FFT off the unit circle," *Scientific Reports*, 9, Article number: 14443, October 8, 2019.
3. Sinapov, J., Schenck, C., Staley, K., **Sukhoy, V.**, and Stoytchev, A. "Grounding Semantic Categories in Behavioral Interactions: Experiments with 100 Objects," *Robotics and Autonomous Systems (RAS)* 62(5) pp. 617–706, May 2014.
2. Griffith, S., Sinapov, J., **Sukhoy, V.**, and Stoytchev, A. "A Behavior-Grounded Approach to Forming Object Categories: Separating Containers from Non-Containers," *IEEE Transactions on Autonomous Mental Development (TAMD)*, 4(1), pp. 54–69, Mar. 2012.
1. Sinapov, J., **Sukhoy, V.**, Sahai, R., and Stoytchev, A. "Vibrotactile Recognition and Categorization of Surfaces by a Humanoid Robot," *IEEE Transactions on Robotics (T-RO)*, 27(3), pp. 488–497, June 2011.

B. Conference and Workshop Papers that Have Undergone Stringent Peer Review:

10. Griffith, S., **Sukhoy, V.**, Wegter, T, and Stoytchev, A. "Object Categorization in the Sink: Learning Behavior–Grounded Object Categories with Water," *In Proceedings of the 2012 ICRA Workshop on Semantic Perception, Mapping, and Exploration (SPME)*, Saint Paul, MN, May 14, 2012.

9. **Sukhoy, V.**, Georgiev, V., Wegter, T., Sweidan, R., and Stoytchev, A. "Learning to Slide a Magnetic Card Through a Card Reader," *In Proceedings of the 2012 IEEE International Conference on Robotics and Automation (ICRA)*, pp. 2398–2404, St. Paul, MN, May 14–18, 2012. [Acceptance rate: 40% overall.]
8. Griffith, S., **Sukhoy, V.**, and Stoytchev, A. "Using Sequences of Movement Dependency Graphs to Form Object Categories," *In Proceedings of the 11th IEEE-RAS International Conference on Humanoid Robots (Humanoids)*, pp. 715–720, Bled, Slovenia, October 26–28, 2011. [Acceptance rate: 14.7% oral, 62% overall.]
7. **Sukhoy, V.**, Griffith, S., and Stoytchev, A. "Toward Imitating Object Manipulation Tasks Using Sequences of Movement Dependency Graphs," *In Proceedings of the 2011 RSS Workshop on The State of Imitation Learning: Understanding its Applications and Promoting its Adoption, held at the Robotics: Science and Systems (RSS) Conference*, Los Angeles, CA, June 27, 2011.
6. Koonce., P., Dutell, V., Farrington, J., **Sukhoy, V.**, and Stoytchev, A. "Toward Learning to Solve Insertion Tasks: A Developmental Approach Using Exploratory Behaviors and Proprioception," *In Proceedings of the 25th National Conference on Artificial Intelligence (AAAI)*, San Francisco, CA, August 7–11, 2011.
5. **Sukhoy, V.** and Stoytchev, A. "Learning to Detect the Functional Components of Doorbell Buttons Using Active Exploration and Multimodal Correlation," *In Proceedings of the 10th IEEE International Conference on Humanoid Robots (Humanoids)*, Nashville, TN, December 6–8, 2010. [Acceptance rate: 21.5% oral, 77% overall.]
4. **Sukhoy, V.**, Sinapov, J., Wu, L., and Stoytchev, A. "Learning to Press Doorbell Buttons," *In Proceedings of the 9th IEEE International Conference on Development and Learning (ICDL)*, pp. 131–139, Ann Arbor, MI, August 18–21, 2010. [Acceptance rate: 29.6% oral, 66.6% overall.]
3. Wu, L., **Sukhoy, V.**, and Stoytchev, A. "Toward Learning to Press Doorbell Buttons," *In Proceedings of the 24th AAAI Conference on Artificial Intelligence*, pp. 1965–1966, Atlanta, GA, July 11–15, 2010.
2. Griffith, S., Sinapov, J., **Sukhoy, V.**, and Stoytchev A. "How to Separate Containers from Non-Containers? A Behavior-Grounded Approach to Acoustic Object Categorization," *In Proceedings of the 2010 IEEE International Conference on Robotics and Automation (ICRA)*, pp. 1852–1859, Anchorage, Alaska, May 3–8, 2010. [Acceptance rate: 41.1% overall.]
1. **Sukhoy, V.**, Sahai, R., Sinapov, J., and Stoytchev, A. "Vibrotactile Recognition of Surface Textures by a Humanoid Robot," *In Proceedings of the Humanoids 2009 Workshop entitled "Tactile Sensing in Humanoids — Tactile Sensors and Beyond,"* which was held at the 9th IEEE-RAS International Conference on Humanoid Robots (Humanoids), pp 57–60, Dec. 7th, 2009.

C. Creative Works (Competitions, Exhibitions, or Performances):

3. **Sukhoy, V.** and Stoytchev, A. "Detecting the Functional Components of Doorbell Buttons," a research video shown at the *AI and Robotics Multimedia Fair*, held as a part of the AAAI-2012 conference in Toronto, Ontario, Canada, July 24–26, 2012.
2. Griffith, S., **Sukhoy, V.**, Wegter, T., and Stoytchev A. "Object Categorization in the Sink: Learning Behavior-Grounded Object Categories with Water," a research video shown at the *AI and Robotics Multimedia Fair*, held as a part of the technical program conjunction with the AAAI-2012 conference in Toronto, Ontario, Canada, July 24–26, 2012.
1. **Sukhoy, V.**, Georgiev, V., Wegter, T., Sweidan, R., and Stoytchev, A. "Learning to Slide a Magnetic Card Through a Card Reader," a research video shown at the *AI and Robotics Multimedia Fair*, held as a part of the technical program of the AAAI-2012 conference in Toronto, Ontario, Canada, July 24–26, 2012.

D. Media Coverage

11. ACM TechNews: Computer science, information technology, and related science, society, and technology news (technews.acm.org). April 3, 2020 edition. A selection of news abstracts that includes the link to the ISU News article from March 25, 2020 listed below.
10. "Exploring the Capabilities of the Fast Fourier Transform," by Lauren Saccone, In Compliance Magazine (incompliancemag.com), April 10, 2020. Links to the ISU News Release from March 25, 2020 within the context of the fast Fourier transform.
9. "DSP: Inverse chirp z-transform, where it works and doesn't work," by Steve Bush, Electronics Weekly (ElecronicsWeekly.com), March 26, 2020. A brief summary of the paper entitled "Numerical error analysis of the ICZT algorithm for chirp contours on the unit circle."
8. "Solving a 50-year-old puzzle in signal processing, part two," by Mike Krapfl, Iowa State University News Service, March 25, 2020. Reposted by Bioengineer (bioengineer.org), EurekAlert! (eurekalert.org), Newswise (newswise.com), Science Daily (sciencedaily.com), Sciencenewsnet.in, and Tech Xplore (techxplore.com).

7. "Best of Last Year: The top TechXplore articles of 2019," by Bob Yirka, Tech Xplore (techxplore.com), December 16, 2019. Lists an online news article for the paper entitled "Generalizing the inverse FFT off the unit circle" as the first among the 24 top articles from 2019.
6. "Algorithms for Optics: Generalized version of the inverse fast Fourier transform is computationally efficient," by John Wallace, LaserFocusWorld (laserfocusworld.com), November 19, 2019. Links to the paper entitled "Generalizing the inverse FFT off the unit circle" in an online article that also lists some applications of the FFT and the IFFT in optical calculations.
5. "Inverse Chirp-Z Algorithm Finally Cracked," by Thomas Scherer, Elektor Magazine. Online article, posted on October 15, 2019 (elektormagazine.com). Also published in Dutch (elektormagazine.nl) and German (elektormagazine.de).
4. "Best of Last Week," by Bob Yirka, Science X Network (sciencex.com), October 14, 2019. Lists an online news release for the paper entitled "Generalizing the inverse FFT off the unit circle" among the best technology research news for that week.
3. "Researchers develop a more versatile, generalized version of the inverse fast Fourier transform," LaserFocusWorld (laserfocusworld.com), online article, adapted from the ISU News Release, October 11, 2019.
2. "Engineers Solve 50-Year-Old Puzzle in Signal Processing," Communications of the ACM (cacm.acm.org), online article, reposted from the ISU News Release, October 11, 2019.
1. "Engineers solve 50-year-old puzzle in signal processing," by Mike Krapfl, Iowa State University News Service, October 10, 2019. Reposted by 7th Space Family Portal (7thspace.com), Newsbeezer (newsbeezer.com), Newswise (newswise.com), Science Daily (sciencedaily.com), Scitech Daily (scitechdaily.com), Tech Xplore (techxplore.com), and Technology Networks (technologynetworks.com).

IV. Recognitions, Honors, and Outstanding Achievements

- Iowa State University Research Excellence Award, Department of Electrical and Computer Engineering. Fall 2019
  An award given by the Department of Electrical and Computer Engineering at Iowa State University in recognition of the quality of research accomplishments.
- Iowa State University Research Excellence Award, HCI Graduate Program. Fall 2019
  An award given by the Human Computer Interaction Graduate Program at Iowa State University in recognition of the quality of research accomplishments.
- Iowa State University Professional Advancement Grant (multiple awards). 2008–2015
  A grant awarded by the Graduate and Professional Student Senate (GPSS) of Iowa State University to support students who travel to academic conferences and symposiums.
- Second Place at the Regional ACM Programming Contest (Donetsk, Ukraine). Spring 2002
  As a part of a three-person student team that represented Donetsk National University at the Eastern Ukrainian Regional International Collegiate Programming Contest (ICPC) organized by the Association for Computer Machinery (ACM).

V. Teaching and Mentoring Experience

A. Instructor

HCI/CprE/ComS 575: Computational Perception — Spring 2020
Undergraduate teaching assistant: Karter Krueger
HCI 560X: Learn to Speak AI — Summer 2020

B. Graduate Teaching Assistant

CprE 281: Digital Logic — Fall 2019
HCI/CprE/ComS 575: Computational Perception — Spring 2019
CprE 185: Intro to Problem Solving (using C) — Fall 2012
HCI/CprE/ComS 575: Computational Perception — Spring 2012
CprE 185: Intro to Problem Solving (using C) — Fall 2011
These courses were taught by Dr. Alexander Stoytchev.

ME/WLC 484/584: Technology, Globalization, and Culture — Fall 2018
ME/WLC 484/584: Technology, Globalization, and Culture — Fall 2017
ME/WLC 484/584: Technology, Globalization, and Culture — Fall 2016
ME/WLC 484/584: Technology, Globalization, and Culture — Fall 2015
ME/WLC 484/584: Technology, Globalization, and Culture — Fall 2014
These courses were taught by Dr. James Oliver and Dr. Mark Rectanus.

HCI/CprE/ComS 575: Computational Perception — Spring 2014
This course was taught by Dr. Jivko Sinapov.

HCI 574: Computational Implementation and Prototyping in HCI — Spring 2019
HCI 574: Computational Implementation and Prototyping in HCI — Spring 2018
HCI 574: Computational Implementation and Prototyping in HCI — Spring 2017
HCI 574: Computational Implementation and Prototyping in HCI — Spring 2016

HCI 574: Computational Implementation and Prototyping in HCI — Spring 2015
These courses were taught by Dr. Chris Harding.

Math 181: Calculus for Life Sciences — Spring 2007
Math 151: Calculus for Business and Social Sciences — Fall 2006
Math 151: Calculus for Business and Social Sciences — Spring 2006
Math 141/142: Trigonometry / Trigonometry and Analytic Geometry — Fall 2005

B. Graduate Student Mentor, NSF Research Experience for Undergraduates (REU)

2. Veselin Georgiev (Southeast Missouri State), — Summer 2011
Todd Wegter (Iowa State University),
Ramy Sweidan (Rice University).
NSF REU in Human Computer Interaction

1. Philip Koonce (Swarthmore College), — Summer 2010
Vasha Dutell (University of Oregon),
Jose Farrington (University of Puerto Rico at Rio Piedras).
NSF REU in Human Computer Interaction

VI. Employment History

Iowa State University — Ames, IA

Lecturer — Spring 2020 – Summer 2020
Worked as an instructor for graduate-level courses on computational perception and AI.

Graduate Teaching Assistant — Multiple semesters (see above)
Worked as a teaching assistant for the Department of Electrical and Computer Engineering and the Human Computer Interaction Graduate Program.
Supervised by Dr. Alexander Stoytchev, Dr. Chris Harding, Dr. James Oliver, Dr. Mark Rectanus, and Dr. Jivko Sinapov.

Graduate Research Assistant — Summer 2018
Maintained and extended web sites for the AFLEX project.
Supervised by Dr. Stephen Gilbert and Dr. Annette O'Connor.

Graduate Research Assistant — January 2013 – February 2014
Worked as a graduate-level research assistant.
Supervised by Dr. Alexander Stoytchev.

Graduate Research Assistant — January 2012 – July 2012
Worked as a graduate-level research assistant.
Supervised by Dr. Alexander Stoytchev.

Graduate Teaching Assistant — Fall 2011, Fall 2012
Worked as a teaching assistant at the Department of Electrical and Computer Engineering. Developed and supported a system for automatic scoring of student homeworks for CprE 185 "Intro to Problem Solving (using C)".
Supervised by Dr. Alexander Stoytchev.

Graduate Research Assistant — Fall 2009 – Summer 2011
Worked as a graduate-level research assistant at the Virtual Reality Applications Center.
Supervised by Dr. Alexander Stoytchev.

Graduate Assistant (VRAC) Fall 2007 –
Developed and maintained web sites. Developed software to support communications between internal systems at the Virtual Reality Applications Center and the Human–Computer Interaction Graduate Program. Supervised by Kevin Teske. Spring 2009

Graduate Teaching Assistant (Department of Mathematics) Fall 2005 –
Worked as a graduate-level teaching assistant for entry-level college courses in the Department of Mathematics. Spring 2007

HERE Technologies Berkeley, CA

Summer Intern May 2017 –
Implemented an algorithm that performed probabilistic filtering of signals derived from the data recorded from moving vehicles. Supervised by Vishal Jain. Aug 2017

NAVTEQ Inc. Chicago, IL

Summer Intern May 2006 –
Developed data visualization software and data collection software to support a LIDAR-based distance measurement device mounted on a car. Supervised by Brad Kohlmeyer. Aug 2006

Google Inc. (Student Developer, Received a Stipend)

Participated in the Google Summer of Code Program in 2005 May 2005 –
Designed and implemented a Python library to input data to a program and output data from a program asynchronously. Project mentor: Mark Hammond (Python Software Foundation). Aug 2005

Institute of Software Systems, National Academy of Sciences Kiev, Ukraine

Laboratory Assistant Jan 2005 –
Designed and developed software using Python and C++. Jun 2005

Department of Mathematics, Donetsk National University Donetsk, Ukraine

Student Software Developer Jan 2003 –
As a part of a team of three students, developed web-based software to administer exams to students. Jul 2003

VII. Service (Disciplinary, Professional, Public, and University)

Service to Disciplinary and Professional Associations and Societies:

9. Journal Reviewer, *IEEE Access*. Spring 2019
8. Reviewer, the 2019 IEEE International Conference on Robotics and Automation (ICRA 2019). Fall 2018
7. Reviewer, the 7th Joint IEEE International Conference on Development and Learning and on Epigenetic Robotics (ICDL-EpiRob 2017). Spring 2017
6. Reviewer, the 2017 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS-2017). Spring 2017
5. Reviewer, the 30th AAAI Conference on Artificial Intelligence (AAAI-16). Fall 2015

4. Reviewer, the 2015 IEEE-RAS International Conference on Humanoid Robots (Humanoids-2015). — Summer 2015
3. Journal Reviewer, *Autonomous Robots*. — Spring 2013
2. Volunteer, the 25th AAAI Conference on Artificial Intelligence (AAAI-11), August 7–11, 2011, San Francisco, CA. — August 2011
1. Reviewer, the 9th International Conference on Development and Learning (ICDL-2010) — Fall 2010

VIII. References

A list of references is available upon request.