

Brooklyn College
The City University of New York



**COMPUTER AND INFORMATION SCIENCE
DEPARTMENT NEWSLETTER**
June 2018, Vol 6

**A Publication of the Brooklyn College
CIS Department**

Welcome to the Sixth Volume of the Brooklyn College Computer and Information Science Department Newsletter. We are proud to include the accomplishments of the department's faculty and students as well. This Newsletter presents activities that primarily have taken place between June 2017 and May 2018.

Faculty Activities

Distinguished Professor Rohit Parikh

Publications

An Epistemic Generalization of Rationalizability
Logic, Language, Information, and Computation
Proceedings of the 24th International Workshop,
WoLLIC 2017, London, UK, July 18-21, 2017,
Editors: Kennedy, Juliette, de Queiroz, Ruy (Eds.)
Pages 295-305.

Presentations:

Wollic workshop (London) July 2017
Mathematics of Language (London) July 2017
Bristol University philosophy department, July 2017
Columbia University seminar in logic, probability and
games, December 2017
Midwest Political Science Association, Chicago, April
2018
Unilog conference, Vichy, France, June 2018.

Doctoral students graduated:

Yunqi Xue (CS) "Towards Homo Sociologicus",
August 2017

Todd Stambaugh (Math) "Coincidence of Bargaining
Solutions and Rationalizability in Epistemic Games",
April 2018

Jongjin Kim (Philosophy), "Morality as Social
Software", May 2018

Activities:

Organized *The Logic of Social Networks* with Shweta Jain and Priya Chakraborty as other speakers and Robert Cherry as moderator.

Chaired a meeting at Stanford on Logic and Social Agency.

Advisory Board, Journal of Philosophical Logic
Organizer: Seminar in Logic, Games and Society

Distinguished Professor Ted Raphan

Refereed Journal Publications:

Yakushin, S.B., **Raphan, T.**, Cohen, B. Coding of velocity storage in the vestibular nuclei. *Front. Neurol.*, 8:1-19, 2017.

Cohen, B., Martineli, G.P., Xiang, Y., **Raphan, T.**, Yakushin, S.B. Vestibular activation habituates the vasovagal response in the rat. *Front. Neurol.* 8:1-16, Article 83, 2017.

Raphan, T., B. Cohen, Y. Xiang and S. Yakushin. "A model of blood pressure, heart rate and vaso vagal responses produced by vestibulo-sympathetic activation." *Frontiers in Autonomic Neuroscience* 10:1-16, article 96, 2016.

Yakushin, S.B., Martinelli, G.P., **Raphan, T.**, Cohen, B. The response of the vestibulosympathetic reflex to linear acceleration in the rat, "*J. Neurophysiol.*", 116 (6) 2752-2764; DOI: 10.1152/jn.00217.2016, 2016.

Conference Papers:

Drillick, H. Dorohkin, E. Goetz, L. **Raphan, T.** Developing a Virtual Environment for studying spatial orientation in rotating visual environments. Proc. Soc. Neuroscience 313.01/EE3, 2017

Symposia and Presentations:

Raphan, T. A model of Neurogenic Syncope. Symposium: The Vestibular, Cerebellar, and Sympathetic Systems: Past, Present and Future, *International Conference to Recognize Contributions of Bernard Cohen upon his retirement*. Mt. Sinai School of Medicine, April 13, 2018

Drillick, H. Dorohkin, E. Goetz, L. **Raphan, T.** Developing a Virtual Environment for studying spatial orientation. *Science Day Presentation at Brooklyn College*, May, 2017

Hanon, J., Jarzecki, A., **Raphan, T.** Fast Computational Methods for Studying Molecular Orbitals in Position and Momentum Space Using Gaussian 09 and Matlab, *Science Day Presentation at Brooklyn College*, May, 2017

Editorial Boards:

Member, Editorial Board of Frontiers in Neurology 2015- Present.

Review papers for Frontiers, J. Neurophysiology, Experimental Brain Research, Various Computer Science and Engineering Journals on Robotics.

Supervision of Students:

Doctoral Students:

Hanon, Jonathan: Fast Rendering of Orbitals, Momentum, and Spin Structure, September 2017- Present

Master's Students

Diana Barry. A virtual Reality System for Autistic Training, Completed February, 2018

Undergraduate Students:

Eugene Dorokhin. Developing a Recurrent Neural Net for modeling Timing –Aug 2017- Present

Eugene Dorokhin. Developing a Virtual Reality System for Studying Spatial Orientation, Sept. 2016 – June 2017

Hindy Drillick. Developing a Virtual Reality System for Studying Spatial Orientation, Sept. 2016- June, 2017.

Neng-Fa Zhou

Zhou, Neng-Fa and Bartak, Roman “Efficient Declarative Solutions in Picat for Optimal Multi-Agent Pathfinding”, Technical Communications of the 33rd International Conference on Logic Programming (ICLP 2017)

Zhou NF., Kjellerstrand H. (2017) “Optimizing SAT Encodings for Arithmetic Constraints”. In: Beck J. (eds) Principles and Practice of Constraint Programming. CP 2017. Lecture Notes in Computer Science, vol 10416. Springer, Cham

Roman Barták, Lukáš Chrpá, Agostino Dovier, Jindřich Vondrážka and Neng-Fa Zhou, “Modeling and solving planning problems in tabled logic programming: Experience from the Cave Diving domain”, *Science of Computer Programming*, Volume 147, 1 November 2017, Pages 54-77

Dor Atzmon, Ariel Felner, Roni Stern, Glenn Wagner, Roman Barták, Neng-Fa Zhou: “k-Robust Multi-Agent Path Finding”, SOCS 2017: 157-158

Awards:

PicatSAT won the bronze medal in MiniZinc Challenge 2017, a very influential competition for constraint programming solvers.

Activities:

ICLP'17, AAI'17, IJCAI'17, PADL'18, ICLP'18, RACA'18, LPOP'18, RuleML'18

Scott Dexter

Publications:

J. P. Muñoz, R. Boger, S. Dexter, J. Li, and R. Low. “Image Recognition of Disease-Carrying Insects: A System for Combating Infectious Diseases using Image Classification Techniques and Citizen Science.” *Proceedings of Hawaii International Conference on System Sciences 2018 (HICSS-51)*. <http://hdl.handle.net/10125/50247>. Awarded best paper award at the conference.

Presentations:

Presented "Does TBL Boost Retention for Under-represented Undergraduates in Computer Science?" at the 17th Annual Team-Based Learning Collaborative Meeting. (March 1-3)

Activities:

Scott is serving this year and next as Director of the College's Roberta S. Matthews Center for Teaching

Noson Yanofsky

Publications:

"Theoretical Computer Science for the Working Category Theorist" was posted on the arxiv at <https://arxiv.org/pdf/1710.03090.pdf>. The paper was invited to be posted as a research report at the Centre for Discrete Mathematics and Theoretical Computer Science. The paper can be found here: <https://www.cs.auckland.ac.nz/research/groups/CDMT/CS/researchreports/index.php?serial>

"Paradoxes, Contradictions, and the Limits of Science" which was originally published in the *American Scientist* (2016) was published in *The Best Writing on Mathematics 2017*, edited by Mircea Pitici, (Princeton University Press).

"Finding Structure in Science and Mathematics" won a fourth place prize in Fundamental Questions Institute (FQXi) and will be published in a book tentatively titled *Wandering Towards a Goal* (Springer, The Frontier Collection). A version of this paper appeared as "Chaos Makes The Multiverse Unnecessary" Nautilus. June 22, 2017. <http://nautil.us/issue/49/the-absurd/chaos-makes-the-multiverse-unnecessary>

"Galois Theory of Algorithms" was published in *Rohit Parikh on Logic, Language and Society* Edited by Can Başkent, Lawrence S. Moss, Ramaswamy Ramanujam, (Springer 2017).

Activities:

Invited lecturer From February 20, 2017 to February 24, 2017 at Kyushu Institute of Technology (九州工業大学) in Iizuka Japan.

Dina Sokol

Publications:

M. Amit, M. Crochemore, G.M. Landau, and D. Sokol. "Locating Maximal Approximate Runs in a String". *Theoretical Computer Science* (700),45-62, 2017.

A. Amir, M. Amit, G. M. Landau, and D. Sokol. "Period Recovery of Strings over the Hamming and Edit Distances". *Theoretical Computer Science*, (710), 2-18, 2018.

Activities

Professor Dina Sokol mentored a Masters student, Louise Yan, in collaboration with Dr. Yupu Liang, Director of Bioinformatics Program at the Clinical and Translational Science Center of Rockefeller University. The scope of the project was to do classification on a high dimensional data set (500 questions bleeding related questionnaire with 500 normal and ~100 people with a bleeding disorder). The goal was to find a subset of questions that give us the most prediction power on whether an incoming patient would experience excessive bleeding during an operation. Louise used Decision Trees and Random Forests for classification, and evaluated the sensitivity and specificity of the results.

Professor Sokol has been working with an excellent undergraduate student, Christian Butron on a CISC5001 project. The goal of his project was to analyze the performance of compressed suffix trees (CST) in comparison to uncompressed suffix arrays in a program that implemented the Landau-Vishkin 1989 edit distance algorithm.

Professor Sokol has hosted her collaborators on her BSF grant three times during the Fall semester. Brooklyn College has become an active site for research in Stringology. Professors Amir, Landau, and Geurra visited for lengthy discussions on new research. Two journal papers resulted from the collaboration, and another paper was submitted to a conference.

Jim Cox

Publications:

Wen-Ju Cheng, Jim Cox, Paula A. Whitlock:
“Random walks on graphs and Monte Carlo methods”.
Mathematics and Computers in Simulation 135: 86-94
(2017)

Activities:

Jim has assumed the responsibilities of Graduate
Deputy Chair

Yedidiah Langsam

Publications:

Y. Langsam, Workbook for Java, 2018

Paula Whitlock

Publications:

Jie Li, Jianliang Zheng, Paula A. Whitlock:
“Efficient deterministic and non-deterministic
pseudorandom number generation”. *Mathematics and
Computers in Simulation* 143: 114-124 (2018)

Wen-Ju Cheng, Jim Cox, Paula A. Whitlock:
“Random walks on graphs and Monte Carlo methods”.
Mathematics and Computers in Simulation 135: 86-94
(2017)

Activities:

Her Ph.D. student, **Robert Gezelter**, successfully
defended his dissertation, "Rearchitecting Mass
Storage Input/Output for Increased Efficiency
and Performance" on April 20, 2018.

Rivka Levitan

Publications:

M. Morales, S. Scherer, R. Levitan. “A Linguistically-
Informed Fusion Approach for Multimodal Depression
Detection.” Proceedings of CLPsych, 2018.

A. Weise & R. Levitan. “Looking for Structure in
Lexical and Acoustic-Prosodic Entrainment
Behaviors.” In Proceedings of NAACL, 2018.

M. Morales, S. Scherer, R. Levitan. "OpenMM: An
Open-Source Multimodal Feature Extraction Tool." In
Proceedings of Interspeech, 3354--3358, 2017.

M. Morales, S. Scherer, R. Levitan. "A Cross-Modal
Review of Indicators for Depression Detection
Systems." In Proceedings of CLPsych, 1--12, 2017.

Activities:

Panelist on the "Students Meet Experts" discussion
panel at Interspeech in Stockholm, Sweden, in August
2017.

Panelist, together with Lisa Dallmer of BlackRock, at
the April 2018 meeting of the NYC Alternative
Investment Roundtable, co-hosted by Bloomberg.

Served on program committees for ICASSP,
Interspeech, and NAACL, and was an ad-hoc reviewer
for the NSF Computational Cognition Panel.

Her Ph.D. student, **Michelle Morales**, successfully
defended her dissertation in December and is now at
IBM.

Devorah Kletenik

Publications:

Devorah Kletenik and Deborah Sturm. “Game
Development with a Serious Focus.” In SIGCSE '18:
Proceedings of the 49th ACM Technical Symposium
on Computer Science Education, pp 652 – 657. ACM,
2018.

Eric Bach, Jeremie Dusart, Lisa Hellerstein and
Devorah Kletenik. “Submodular Goal Value of
Boolean Functions.” Discrete Applied Mathematics,
238: 1 -- 13, 2018.

Lisa Hellerstein and Devorah Kletenik. “Revisiting the
Approximation Bound for Stochastic Submodular
Cover.” Discrete Structures in Machine Learning
(DISCML), 2017.

“Game Development with a Serious Focus.” Devorah
Kletenik and Deborah Sturm. CUNY Games Network
4.0, 2018.

Grants:

PSC CUNY Cycle 49 proposal "Symmetric Boolean
Function Evaluation" was accepted.

Michael Mandel

Publications:

Book chapters:

M. I. Mandel and J. P. Barker, "Multichannel spatial clustering using model-based source separation," in *New Era for Robust Speech Recognition: Exploiting, Deep Learning* (S. Watanabe, M. Delcroix, F. Metze, and J. R. Hershey, eds.), ch. 3, Springer, 2017.

X. Xiao, S. Watanabe, H. Erdogan, M. Mandel, L. Lu, J. R. Hershey, M. L. Seltzer, G. Chen, Y. Zhang, and D. Yu, "Discriminative beamforming with phase-aware neural networks for speech enhancement and recognition," in *New Era for Robust Speech Recognition: Exploiting, Deep Learning* (S. Watanabe, M. Delcroix, F. Metze, and J. R. Hershey, eds.), ch. 4, Springer, 2017.

Refereed Conference Proceedings:

S. Maiti and M. I. Mandel, "Concatenative resynthesis using twin networks," in *Proceedings of Interspeech*, pp. 3647–3651, 2017.

Workshops:

H. Ghaly and M. I. Mandel, "Analyzing human and machine performance in resolving ambiguous spoken sentences," in *1st Workshop on Speech-Centric Natural Language Processing (SCNLP)*, pp. 18–26, 2017.

J. Choi and M. I. Mandel, "Perception of Korean fricatives and affricates in 'bubble' noise by native and nonnative speakers," in *International Circle of Korean Linguistics*, 2017.

Grants:

National Science Foundation Award IIS-1750383, June 2018 – May 2023. "CAREER: Integrating perceptual models of auditory importance into deep learning-based noise-robust speech recognition." PI: Michael Mandel. \$497,162.

Grant Description: Hearing is central to human interaction, but the hearing process is not easily observed. The objective of this project is to train models to identify portions of speech utterances that are important to their being correctly identified by human listeners, and to use predictions from these models to make automatic speech recognition (ASR) systems more noise robust by focusing on those

regions. The ability to identify important regions of an utterance could significantly advance our understanding of healthy and impaired hearing. Improvements in automatic speech recognition would have broader impacts on the 260 million Americans who use smartphones and the \$100 billion ASR industry. The educational portion of this project utilizes examples from speech, language, audio, and music processing to attract and retain students in Brooklyn College's introductory programming course serving a diverse student body along with similar efforts at affiliated high school programs.

Tziporah Halevi

Publications:

Benhamouda F., Halevi S, and Halevi T., "Supporting Private Data on Hyperledger Fabric with Secure Multiparty Computation", *First IEEE Workshop on Blockchain Technologies and Applications* (BTA), 2018

Halevi S., Halevi T., Shoup V. and StephensDavidowitz N., "Implementing BP-Obfuscation Using Graph-Induced Encoding", *ACM Conference on Computer and Communications Security* (ACM CCS), 2017

Halevi, T., Memon, N. D., Lewis, J., Kumaraguru, P., Arora, S., Dagar, N., Aloul, F. A., and Chen, J. "Cultural and Psychological Factors in Cyber-Security", *Journal of Mobile Multimedia* (JMM), 2017

Hui Chen

Publications:

B. Fu, Y. Xiao, and H. Chen, "FNF: Flow-net based fingerprinting and its applications," *Computers & Security*, vol. 75, pp. 167 - 181, June 2018.

K. Damevski, H. Chen, D. Shepherd, N. A. Kraft, and L. Pollock, "Predicting future developer behavior in the IDE using topic models," *IEEE Transactions on Software Engineering*, September, 2017.

Grants:

PSC-CUNY Award # 61067-00 49, for "Building Highly Interpretable IDE Interaction Model from Multi-Datasets", \$3,500, 2018 - 2019

Student Achievements

BC's CUNY Hackathon, consisting of **Yvan Pangilinan**, **Kevin Cybura** (Hunter College), **Hui Lin** (Queens College), **Christopher Menedes** and **Truth Opaleye** won 3 categories of prizes:

- Best Hack using IBM Cloud Technology
- Best Hack using NYC Open Data
- 1st Place Overall

The team designed a full stack web platform that provides centralized homelessness prevention services to those in need.



BC Hackathon Team

Two of our very own Brooklyn College WiCS students, **Estefanía Barrón** and **Frances Shnaidman**, won first place and \$25,000 in the Standard Chartered Women + Tech4NYC Prize category of the Zahn competition for their app CakeWLK. The app connects college students with new friends via safe, reliable, publicly shared walking routes based on crime statistics. They are conducting experiments and consumer research, such as offering free walks, to find out if there is a need or want for their product.

Science Day

Prof Mandel's students:

Christian Sarcona: creating private voice recordings using acoustic echo cancellation

Oleksandr Loyko: beamforming with neural networks for multichannel speech recognition

Xiaowen Huang: extracting drum sounds from a song

Dzmitry Kasinets: Concatenative resynthesis for extracting bass parts from songs



From left to right, Xiaowen Huang, Prof. Michael Mandel, Oleksandr Loyko, Christian Sarcona, and Dzmitry Kasinets.

Prof Kletenik's students:

Philip Gringer, ANTI-SET and Artificial Intelligence.

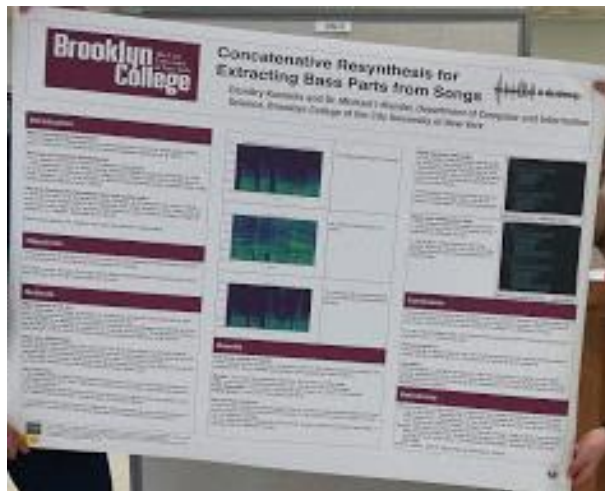
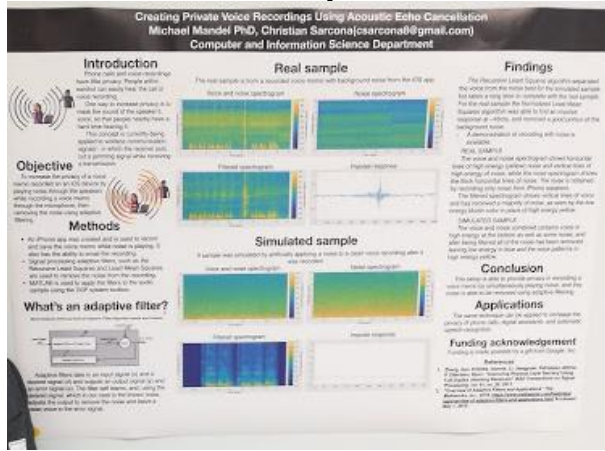
Alyssa Caputo, Bias Against Algorithmic (AI) Music? This work was also accepted to the National Conference on Undergraduate Research (NCUR).

End of Year Party

The Computer Science Club, Women in Computer Science Club and the CIS Department sponsored a well-attended and well stocked End of Year Party for graduating seniors on May 15th in SUBO. The students planned the evening and it was quite a fun time with CIS faculty joining in.



Some of the Science Day Posters



Note: All information presented here was conveyed by our colleagues and the Newsletter Editors cannot take responsibility for verifying its accuracy.

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