COMPUTER AND INFORMATION SCIENCE DEPARTMENT NEWSLETTER
June 2019, Vol 7

A Publication of the Brooklyn College CIS Department

Welcome to the Seventh 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 2018 and May 2019.

Best Wishes to Professor Paula Whitlock Upon Retirement

The following is a shortened version of what was written by Professor Keith Harrow and read by Professor Yedidyah Langsam at the department's retirement party. I believe it represents the sentiment of the entire department.

I have known Paula since she joined the CIS Department in the 80's, and we have worked closely together for many years on the Appointments Committee and other committees. Everyone in the department knows that she is an outstanding teacher, for both elementary and advanced courses. She willingly participates in all the glorious aspects of administrative life which make being a college professor so rewarding, including many years in charge of our department's Core course, serving as a Graduate Deputy Chair, and chairing many college-wide committees, especially the Core and other Curriculum Committees. Paula is an active researcher, with publications ranging from Monte Carlo Methods to Computer Science Education. In fact, it has been my pleasure to work with her on several projects, including SmartTutor for the BC Learning Center.

But most striking of all is her collegiality. In a department, a college, and a university in which things do not always run smoothly, Paula was always a calming influence and a voice of reason. I never heard her yell, and I never heard her lose her temper or say something nasty, no matter how well deserved the nasty comment might be.

The Yiddish word "mensch" is probably the best way to describe Paula. For those who don't know what it means, you can look it up or you can just think about the honoree. But here is the definition from Wikipedia (via Leo Rosten), the most well-respected academic resource in our modern world:

> *A "mensch" is "someone to admire and emulate, someone of noble character. The key to being 'a real mensch' is nothing less than character, rectitude, dignity, a sense of what is right, responsible, decorous." The term is used as a high compliment, implying the rarity and value of that individual's qualities.*

Paula, the department will miss you, but let me welcome you to retirement.

Faculty Activities

Faculty on the Move

Scott Dexter

We are sorry to see Scott leave the college. He has been a valued colleague and has contributed a great deal to the department and the college. He will be missed, but we wish him all the best and much success in his new position.

Katherine Chuang

We welcome Doctoral Lecturer Katherine Chuang and wish her much success in her new position.

Distinguished Professor Rohit Parikh

Publications:

Parikh, Rohit. "Logic Without Language." proceedings of Indian Conference on Logic and Its Applications. Springer, Berlin, Heidelberg, 2019.

Presentations:

When are groups individuals? A talk given at Tufts University, Social Ontology Conference August 2018. Work is continuing.

Logic without language (talk given at Rutgers Univerity in October 2018)

The Logic of Non-persons. (2019). Talk given at the ICLA conference by Dr. R. Ramanujam on my behalf on March 1–5, 2019, Indian Institute of Technology Delhi, India.

Doctoral Students:

Jongjin Kim, received his doctorate in September 2018 from the CUNY Graduate Center on the topic *Morality as Social Software*.

Activities:

Led a session on *Religion, spirituality, morality* at the 23rd Annual Faculty Day Conference, May 16, 2019.

Distinguished Professor Ted Raphan

Journal Publications:

Raphan, T., Dorohkin, E., Delamater, A. Modeling Interval Timing by Recurrent Neural Nets. *Frontiers in Integrative Neuroscience.* 2019 (In Review)

Conference Papers:

Delamater, A., Dorokhin, E., Raphan, T. Modeling interval timing with a recurrent neural network. *Perceptual Learning Workshop,* University of Exeter, June 17-18, 2019.

Raphan, T. Dorokhin, E. Delamater, A. Modeling interval timing with recurrent neural nets. *Proc. Soc. Neurosc.* 2019-S-9399-SfN, 2019.
Ted

Yedidyah Langsam

"Workbook for Java", Brooklyn College - CUNY, 2018.

Neng-Fa Zhou

Publications:

Neng-Fa Zhou and Hakan Kjellerstrand: Encoding PB Constraints into SAT via Binary Adders and BDDs -- Revisited, 25th RCRA International Workshop on "Experimental Evaluation of Algorithms for Solving Problems with Combinatorial Explosion", 2018.

Dor Atzmon, Roni Stern, Ariel Felner, Glenn Wagner, Roman Barták, Neng-Fa Zhou: Robust Multi-Agent Path Finding. SOCS 2018: 2-9.

Neng-Fa Zhou and Hakan Kjellerstrand: A Picat-based XCSP Solver -- from Parsing, Modeling, to SAT Encoding, the Proceedings of the 2018 XCSP Solver competition.

Tutorial:

Neng-Fa Zhou & Roman Bartak: "Modeling and Solving AI Problems in Picat" at PRICAI'18.

Awards:

1st place in COP and 3rd place in SAT in the 2018 XCSP Solver Competition

2nd place in Free Sequential Search and 3rd place in Parallel Search in the 2018 MiniZinc Challenge

Noson Yanofsky

Publications:

Yanofsky, N. "Kolmogorov Complexity and Our Search for Meaning: What Math Can Teach Us about Finding Order in Our Chaotic Lives." The article was published in Nautilus Magazine. It was chosen to be an essay in *The Best Writing on Mathematics of 2019.* *https://press.princeton.edu/titles/14178.html*

Talks:

"Quantum Algorithms" at the Women In Quantum Meetup.

"Quantum Computing: The Buzz and the Hype" on NBC Universal News

"Algorithmic Gems" at Lakewood Software Developers Meetup. https://www.meetup.com/Lakewood-Software-Developers/

Activities:

Continues to run the New York City Category Theory Seminar. The seminars have been videoed and uploaded to YouTube.

Dina Sokol

Publications:

S. H. Geizhals and D. Sokol. Finding Maximal 2-dimensional Palindromes. *Information and Computation*, Volume 266, Pages 161-172, 2019

A. Amir, G.M. Landau, S. Marcus, and D. Sokol. Two-Dimensional Maximal Repetitions, *LIPIcs-Leibniz International Proceedings in Informatics* 112, pages 2:1--2:14, 26th Annual European Symposium on Algorithms (ESA) 2018.

Jim Cox

Publications:

J Cox, T. Pay, S. Lucci "An Ensemble of Automatic Keyphrase Extractors: TextRank, RAKE and TAKE". Computación y Sistemas, Vol. 23, No. 3, 2019.

James L Cox, Stephen Lucci, Tayfun Pay "Effects of Dynamic Variable-Value Ordering Heuristics on the Search Space of Sudoku Modeled as a Constraint Satisfaction Problem" Inteligencia Artificial 22(63), 1-15 doi:10.4114/intartif.vol22iss63pp1-15

Tayfun Pay, James L. Cox, Steve Lucci "Another Perspective on Ensemble Method for Automatic Keyword Extraction" 2018 IEEE International Conference on Big Data (IEEE Big Data 2018) Seattle Full paper invited to Special Issue "Big Data Research, Development, and Applications—Big Data 2018"

James Cox, Tayfun Pay, "An overview of some semantic and syntactic complexity classes". Electronic Colloquium on Computational Complexity (ECCC) 25: 166 (2018).

Rivka Levitan

Awards:

$500,000 NSF CAREER Award To Study Entrainment

Entrainment, the phenomenon of conversational partners' behaving more like each other in various ways, is an important feature for analyzing conversations. It is very common in human-human communication and is associated with high-quality conversations. Because more and more important conversations are happening between humans and virtual conversational agents, it would be useful for such an agent to be able to entrain to the person using it, to increase the rapport between them. However, there is still a lot that is still not known about entrainment, such as what causes it and why people entrain in different ways.

The goal of this CAREER project is to learn more about entrainment in order to improve human-computer communication and to better understand human-human communication. This grant will support Professor Levitan's entrainment research for the next five years and fund the collection of a new corpus of task-oriented speech to enable the analysis of important questions about entrainment. The project also includes a collaboration with Brooklyn College's Linguistics Program to promote the participation of linguistics students in computer science.

Devorah Kletenik

Developing a Serious Game to Reinforce Introductory Programming Concepts

Professors Devorah Kletenik and Deborah Sturm (College of Staten Island) created a game to introduce programming concepts to undergraduate students.

The game includes a storyline, sound effects, graphics, power-ups, and short quiz-like challenges. It provides students with an opportunity to practice their programming skills. The game is intended for a broad audience; gamers and non-gamers, females and underrepresented groups were consulted during the creation of the game. In addition, a wide-scale evaluation of the effectiveness of the game will be performed. The game is available as a WebGL and is playable in a browser without downloading or installation. It was released under a Free Software license, enabling others to modify the game if so desired.

Devorah Kletenik gave an invited talk at the SIGGRAPH Educators' Forum in August 2018 titled "Thinking Seriously About Game Design."

Publications:

Hellerstein, Lisa, and Devorah Kletenik. "Revisiting the Approximation Bound for Stochastic Submodular Cover." In *Journal of Artificial Intelligence Research* 63 (2018): 265-279.

Gkenosis, Dimitrios, Nathaniel Grammel, Lisa Hellerstein, and Devorah Kletenik. "The Stochastic Score Classification Problem." In *26th Annual European Symposium on Algorithms (ESA 2018)*. Schloss Dagstuhl-Leibniz-Zentrum fuer Informatik, 2018.

Caputo, Alyssa with faculty advisors Devorah Kletenik and Justin Steinberg. "A Study on the Perception of Algorithmic Composition Music." In *Proceedings of the National Conference of Undergraduate Research*, 2018.

Kletenik, Devorah, Ruslan Pantaev, Mike Williams, Kwan Hollway, Deborah Sturm. Code Control: A Game for Teaching Introductory Computer Science. Presented at CUNY Games Conference 5.0, 2019.

Two groups of students presented serious games that they created at the CUNY Games Conference:

Kletenik, Devorah, Alon Butbol, Daniel Chan, Wei Chen, Derik Kcow, Matthew LaSpina. Cyber Secured: A Serious Game for Cybersecurity Novices. Presented at CUNY Games Conference 5.0, 2019.

Grants:

Re-engineering the Software Engineering Course. CUNY Career Success Course Innovation.

Developing a Serious Game to Reinforce Introductory Programming Concepts. SIGCSE Special Projects.

Awards:

Teach Access Curriculum Development Award.
Non-Adaptive Evaluation of the Stochastic Score Classification Problem, PSC-CUNY Cycle 50.

Michael Mandel

Publications:

S. Maiti and M. I. Mandel, “Speech denoising by parametric resynthesis,” in Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing, 2019.

S. Maiti, J. Ching, and M. I. Mandel, “Large vocabulary concatenative resynthe-sis,” in Proceedings of Interspeech, pp. 1190–1194, 2018.

V. A. Trinh, B. McFee, and M. I. Mandel, “Bubble cooperative networks for identifying important speech cues,” in Proceedings of Interspeech, pp. 1616–1620, 2018.

A. R. Syed, V. A. Trinh, and M. I. Mandel, “Concatenative resynthesis with improved training signals for speech enhancement,” in Proceedings of Interspeech, pp. 1195–1199, 2018.

Awards:
National Science Foundation Award OPP-1839185, September 2018 – August 2023. " Collaborative Research: Navigating the New Arctic (NNA): Soundscape ecology to assess environmental and anthropogenic controls on wildlife behavior." PI: Michael Mandel. $535,581.
Across North America, Arctic and boreal regions have been warming at a rate two to three times higher than the global average. At the same time, human development continues to encroach and intensify, primarily due to demand for natural resources, such as oil and gas. The vast and remote nature of Arctic-boreal regions typify their landscapes, environment, wildlife, and people, but their size and isolation also make it difficult to study how their ecosystems are changing. To overcome these challenges, autonomous recording networks can be used to characterize "soundscapes" - a collection of sounds that emanate from landscapes. Unlike traditional observing methods that are expensive, labor-intensive, and logistically challenging, sound-recording networks provide a cost-effective means to both monitor and understand the response of wildlife to environmental and anthropogenic changes across vast areas. One particular challenge with this sound-measurement approach is extracting useful ecological information from the large volumes of soundscape data that are collected. This project will develop the techniques necessary to overcome this challenge.

Top 10% of reviewers at the Neural Information Processing Systems (NeurIPS) conference, awarded free conference registration.

Talk:
At the Brooklyn College Biology Seminar to a group of administrators and academics from the Henan Institute of Science and Technology at CUNY City Tech

Hosted NEMISIG workshop at Brooklyn College
Prof Mandel and Prof Johanna Devaney from the Brooklyn College Conservatory of Music hosted NEMISIG 2019 (the North Eastern Music Information Special Interest Group workshop) at the Brooklyn College Library on February 9, 2019. NEMISIG is an annual informal workshop that brings together researchers from various institutions in the Northeastern United States who work on music information retrieval (a field that is construed broadly to include many applications of computation and artificial intelligence to the analysis and processing of music audio and scores). The meeting provides a space for open discussion of new ideas and intends to foster intercollegiate collaboration. It has been held previously at Columbia, NYU, Drexel, Dartmouth, The Echo Nest, Ithaca College, the University of Rochester, and Brown.

NEMISIG 2019 was supported by the Brooklyn College Department of Computer and Information Science and School of Natural and Behavioral Sciences and by Google, Inc.

Supervised Master's thesis:
Mengxuan Zhao, "The Perception of Mandarin Tones in "Bubble" Noise by Native and L2 Listeners". Masters of Arts Thesis in Computational Linguistics at the CUNY Graduate Center. 2019.

Tziporah Halevi

Publications:
Homomorphic Training of 30, 000 Logistic Regression Models, F. Bergamaschi, S. Halevi, T. Halevi, H. Hunt, ACNS 2019

Grants:
PSC CUNY Cycle 50 proposal "Supporting private data in Hyperledger Fabric via secure MPC".

Activities:
Panelist on the "privacy and security in the era of the cloud" discussion panel at the Brooklyn College Faculty Day.

Served on program committee for IEEE Conference on Communications and Network Security (IEEE CNS 2019).

Prof. Halevi has been working with Ph.D. student, Lior Baron on a usability research project. As part of this project, a usable security study was designed and conducted in an accounting firm, utilizing a new client communication platform.

Hui Chen

Publications:
H. Chen, A. Ciborowska, K. Damevski. "Using Automated Prompts for Student Reflection on Computer Security Concepts". In Proceedings of the 24th Annual Conference on Innovation and Technology in Computer Science Education (ITiCSE19), pages 7, ACM 2019

Grant:
PSC-CUNY Award # 62240-00 50, for "Hierarchical Temporal Model for Coding Recommendation in Integrated Development Environments", $3,500, 2019 – 2020

Ira Rudowsky

Supervised Master's thesis:
Umar Iqbal, "Cloud Computing Future – Analysis Pros and Cons".

Prabhleen Kaur, "Knowledge Based Diagnosis System".

Student Achievements

2019 Google Tech Challenge

Five Brooklyn College CIS students were on a team that took second place at the 2019 Google Tech Challenge. More than 100 students from various other colleges/institutes participated in the tech challenge, which took place on April 14, 2019 at Google NYC Location on 8th Avenue in Chelsea.

During the challenge, 29 teams of 5 students from different colleges from all around the Tri-States attempted to solve google engineering problems. Student's were able to experience Google's culture, logical thinking, collaborations, and on-the-spot coding, all of which were key skills needed to be a successful Google software engineer.

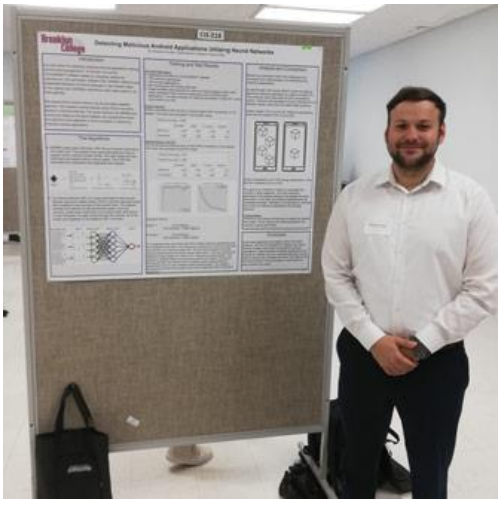
Pictured from left to right: Calvin Kipperman, Zhi De Huang, Brittney Hedenberg (from Google), Kristian Mentor, Kai Lin, Johanny Mateo

Science Day

Two CIS Students are Winners on Science Day

The CIS Department is a power in student research at Brooklyn College. CIS had two winners at Science Day in the Undergraduate Division, both of which tied for second place in the Undergraduate Division. Aleksandr Kovalev, mentored by Professor Tzipora Halevi, on Android malware detection and Joshua N. Sash, mentored by Professor Hui Chen, on determining the accuracy of code-similarity programs.

Alex Kovalev



Alex Kovalev's presented his work on use of neural networks to detect malicious Android applications. The project introduced a newly designed neural network for detecting malware, based on the features extracted from Android .apk files. The proposed Neural Network (NN) is a supervised feed-forward network with two hidden layers. The

algorithm was tested against two existing datasets. Multiple tests were run where the data was split into 66% training data and 33% testing data. The NN achieved a test accuracy of about 95% consistently on the dataset and the recall was in the range of 92-94%. The classification results were compared to the ones obtained from a previous algorithm (Drebin) and the strengths and weaknesses of both methods were analyzed. **Alex was mentored by Professor Tzipora Halevi**.

Joshua N. Sash

Joshua N. Sash showcased his work entitled "Determining Accuracy of Code Similarity Programs" in the Brooklyn College's annual Science Day event in a poster presentation. He examined a few code similarity programs with potential applications in automated plagiarism detection, for which, he devised two strategies, comparing program code directly, and comparing changsets obtained from a source code management system, applied them to program code and revision histories of ~100 students, and obtained encouraging results. **Joshua's work was advised by Professor Hui Chen**.

Winter 2019 Cyber Security Course

A number of our CIS students attended the Winter 2019 Cyber Security Course taught by the Library Academic IT in partnership with iQ4. They earned The "THREATWITHIN" workshop Cybersecurity Workforce Alliance Certificate of Achievement. Darshani Jayaweera, an adjunct in the CIS department and NT Adjunct in AIT, conducted the workshop.

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

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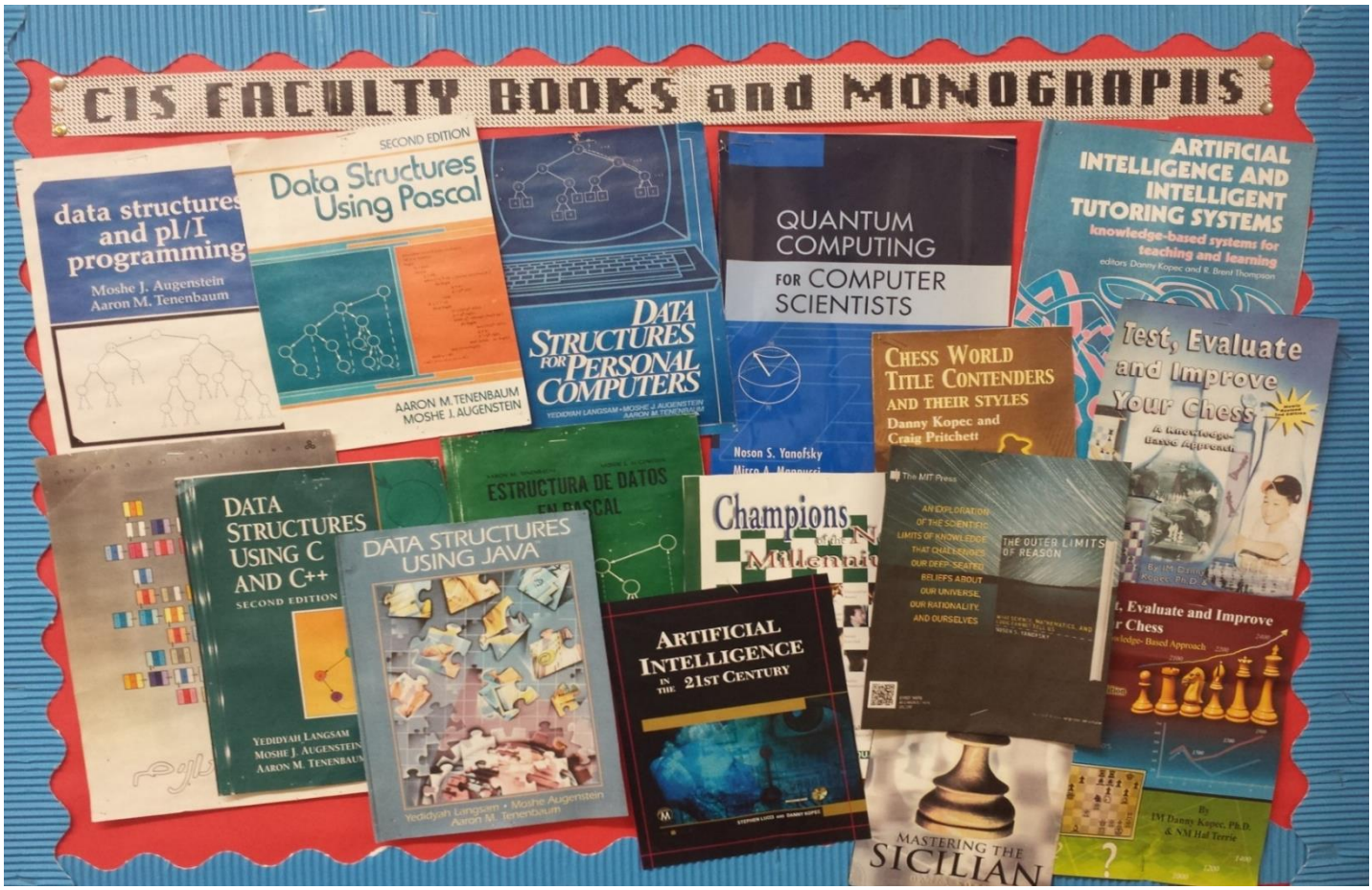
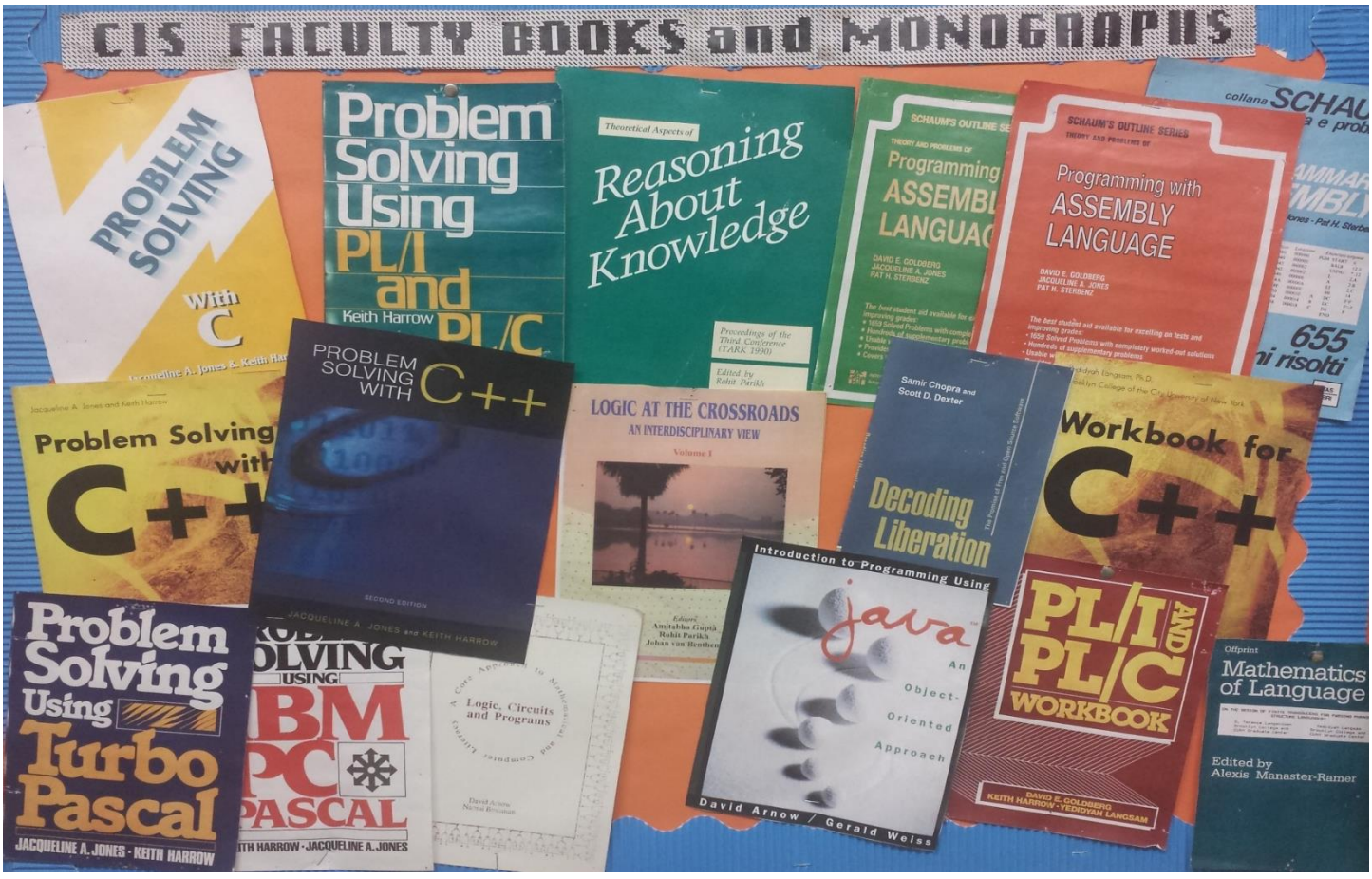
Ira Rudowsky


CIS FACULTY BOOKS and MONOGRAPHS
data structures and pl/I programming
Moshe J. Augenstein
Aaron M. Tenenbaum
SECOND EDITION
Data Structures Using Pascal
AARON M. TENENBAUM
MOSHE J. AUGENSTEIN
DATA STRUCTURES FOR PERSONAL COMPUTERS
QUANTUM COMPUTING FOR COMPUTER SCIENTISTS
ARTIFICIAL INTELLIGENCE AND INTELLIGENT TUTORING SYSTEMS
knowledge-based systems for teaching and learning
CHESS WORLD TITLE CONTENDERS AND THEIR STYLES
Danny Kopec and Craig Pritchett
Test, Evaluate and Improve Your Chess
DATA STRUCTURES USING C AND C++
SECOND EDITION
YEDIDYAH LANGSAM
MOSHE J. AUGENSTEIN
AARON M. TENENBAUM
DATA STRUCTURES USING JAVA
ESTRUCTURA DE DATOS
Champions
THE OUTER LIMITS OF REASON
ARTIFICIAL INTELLIGENCE IN THE 21st CENTURY
MASTERING THE SICILIAN


CIS FACULTY BOOKS and MONOGRAPHS
PROBLEM SOLVING With C
Problem Solving Using PL/I and PL/C
Keith Harrow
Theoretical Aspects of
Reasoning About Knowledge
Proceedings of the Third Conference (TARK 1990)
Edited by Rohit Parikh
SCHAUM'S OUTLINE SERIES
Programming with ASSEMBLY LANGUAGE
DAVID E. GOLDBERG
JACQUELINE A. JONES
PAT H. STERBENZ
655 esercizi risolti
Problem Solving with C++
LOGIC AT THE CROSSROADS
AN INTERDISCIPLINARY VIEW
Volume I
Samir Chopra and Scott D. Dexter
Decoding Liberation
Workbook for C++
Problem Solving Using Turbo Pascal
JACQUELINE A. JONES · KEITH HARROW
IBM PC PASCAL
Logic, Circuits and Programs
Introduction to Programming Using
Java
An Object-Oriented Approach
David Arnow / Gerald Weiss
PL/I AND PL/C WORKBOOK
KEITH HARROW · YEDIDYAH LANGSAM
Offprint
Mathematics of Language
Edited by Alexis Manaster-Ramer