We are delighted to share with you various news and accomplishments of the Department of Computer Science during the year 2018. During the year, the department had 14 full-time faculty members assisted in teaching by an additional 22 part-time faculty members. The total number of undergraduate majors and minors was 372 and the number of graduate students was 80. The department awarded 76 undergraduate diplomas and 45 graduate diplomas. Faculty research included key areas such as Security, Networks, Blockchain, Machine Learning, Big data, Bioinformatics, Genetics, and Computer Science Education. In all, the department faculty published 37 journal and conference articles, made 24 poster presentations, and gave 6 invited talks. Student research is a significant part of the overall productivity with over 60% of the research publications co-authored with students. More than 50 students participated in internship programs in the industry. Faculty obtained new research funding in the amount of $260K, while continued funding from previous years amounted to $3.4 million. Research funding Agencies included, NSF, NIH and Kimberly Clark. Details of this summary are available in the following pages. We are poised to continue to grow our student and faculty accomplishments in the coming years.

CHANDRA N SEKHARAN
PROFESSOR AND CHAIR

FACULTY
14 full-time
22 part-time

STUDENTS
372 undergraduate majors and minors
80 graduate students
Dr. Eric Chan-Tin joined the CS Department from Oklahoma State University in Fall, 2018, as an Assistant Professor focusing on cybersecurity, including network security, distributed systems, privacy, and anonymity. Dr. Chan-Tin obtained his PhD from University of Minnesota in 2011.

The following new part-time faculty members contributed to our teaching mission in 2018.

**John O’Sullivan, MS**, Computer Science (2018), Loyola University Chicago

**Dr. Leo Iraklitis, PhD**, Colorado State University (2000)

**Dr. Ammar Ahmed, PhD**, National University of Ireland (2011).

**NEW FACULTY APPOINTMENTS & RESOURCES**

**COMPUTER SCIENCE DEPARTMENT OVERVIEW**

CS Department website
https://www.luc.edu/cs/

CS Faculty and Staff Directory
https://www.luc.edu/cs/people/

CS Department academics
https://luc.edu/cs/academics/

CS Department Collection, Loyola eCommons
https://ecommons.luc.edu/cs_facpubs/

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The CS Department acquired and placed into service a new high performance computing cluster at the Research Data Center at the Lake Shore Campus. This equipment will be used by students and faculty for teaching and research purposes; at left are some pictures of the cluster.
BIOINFORMATICS AND GENETICS


15. Castignetti D, Polley N, Putonti C. Draft genome sequence of the siderophore-degrading soil bacterium Mesorhizobium loti LU. Genome Announc, 2018, 6: e00029-18. (Open Access)


SECURITY, NETWORKS, AND BLOCKCHAIN


3. Ahmed S. Kaseb, Bo Fu, Anup Mohan, Yung-Hsian Lu, Amy Reibman, George K. Thiruvathukal, “Analyzing Real-Time Multimedia Content From Network Cameras Using CPUs and GPUs in the Cloud“, March 21, 2018


MACHINE LEARNING AND BIG DATA


CONTINUED ➤


SOFTWARE METRICS AND CONCURRENCY


COMPUTER SCIENCE EDUCATION


INVITED TALKS


7. Lucia Dettori, Dale Reed, Steven McGee, Don Yanek, Andrew Rasmussen, Ronald Greenberg. “RPP Panel Chicago: History of CAFECs”, Presented at grant-writing workshop sponsored by the National Science Foundation, March 1, 2018


9. Nicholas J. Hayward. “Learning from our mistakes: discerning patterns in learner errors from language acquisition”, DH 2018 Conference, El Colegio de México, La Universidad Nacional Autónoma de México, and La Red de Humanidades Digitales, Mexico City, Mexico, June, 2018

ARXIV AND TECHNICAL REPORTS


4. Konstantin Läufer, John O’Sullivan, George K. Thiruvathukal, “Auto-generated Spies Increase Test Maintainability”, Computer Science: Faculty Publications and Other Works, August 29, 2018


7. Nasir U. Eisty, George K. Thiruvathukal, Jeffrey C. Carver, A Survey of Software Metric Use in Research Software Development, Computer Science: Faculty Publications and Other Works, October 29, 2018

8. George K. Thiruvathukal, Shilpika, Nicholas J. Hayward, Konstantin Läufer, “Metrics Dashboard: A Hosted Platform for Software Quality Metrics”, Computer Science: Faculty Publications and Other Works, April 8, 2018

9. William L. Honig. “Programmer Thinking”, Spring, 2018

POSTERS


CONTINUED ▷


19. Intelligent Systems for Molecular Biology Conference, Chicago, IL, July 6-10, Poster: “Gene-based association study for lipid traits in diverse cohorts” Angela Andaleon*, Lauren S. Mogil, Heather E. Wheeler


21. Chicago Area Undergraduate Research Symposium, DePaul University, Chicago, IL, April 15, Poster: “Predicting the Genetic Regulation of Schizophrenia in African American Populations” Peter Fiorica*, Heather E. Wheeler

22. Chicago Area Undergraduate Research Symposium, DePaul University, Chicago, IL, April 15, Poster: “Optimizing Gene Predictors in Diverse Populations” Jennifer Takamura*, Heather E. Wheeler

23. Chicago Area Undergraduate Research Symposium, DePaul University, Chicago, IL, April 15, Poster: “Genome-based association study for lipid traits in diverse cohorts implicates BACE1 and SIPT2 regulation in triglyceride levels” Angela Andaleon*, Heather E. Wheeler
RESEARCH GRANTS & PATENTS

GRANTS WITH NEW FUNDING STARTING IN 2018

1. Albert, MV. Rehabilitation Engineering Research Center, Oct 2018 - Sep 2023 (role: subcontract - $97,000) through the Shirley Ryan AbilityLab for “Fall Catcher: Wearable Airbag Technology to Mitigate Falls in Individuals with Stroke”


4. Gregory J. Matthews (PI) and George K. Thiruvathukal (co-PI), Collaborative Research: Statistical Analysis of Partially Observed Shapes in Two Dimensions, National Science Foundation, $75,028.00

ONGOING ACTIVE GRANTS IN 2018

1. Lucia Dettori (PI), Ronald Greenberg (co-PI), Dale Reed (co-PI), Don Yanek (co-PI), Alan Mather (co-PI), Brenda Wilkerson (former co-PI). Track 2 CS10K: Accelerate ECS4ALL. National Science Foundation CNS-1542971. 10/15/15--9/30/19. $999,438.

2. Ronald Greenberg (PI), George K. Thiruvathukal (co-PI), Collaborative Research: Chicago Alliance For Equity in Computer Science CAFECS. National Science Foundation CNS-1738691. 10/15/17 -- 09/30/21. $72,497 Loyola portion of a $2,011,529 collaboration

3. Steven McGee (PI), Ronald Greenberg (co-PI), Alan Mather (co-PI), Brenda Wilkerson (former co-PI). What Features of the Exploring Computer Science Course Equitably Inspire Students to Pursue Further Computer Science Coursework? National Science Foundation CNS-1543217. 10/1/15--9/30/19. $599,986. REU supplement $16,000.


5. Wheeler, HE (PI). NIH R15 HG009569 (05/01/17 - 04/30/20). Predicting gene regulation across populations to understand mechanisms underlying complex traits. $429,000.

PATENTS


OTHER PRODUCTS

**Catherine Putonti**, 2018 CRA-E Undergraduate Research Faculty Mentoring Award, Computing Research Association.

**Heather Wheeler**, 2018 Sujack Family Award for Faculty Research Excellence.


https://www.nature.com/articles/nrurol.2018.23


**Catherine Putonti**, 2018. “A Study on Bacteria in Female Bladders Could Lead to Improved Treatment of UTI’s” Loyola University Medical Center Press Release.
INTERNSHIPS

Robert Yacobellis, the CS undergraduate internship coordinator, reports that there were 49 undergraduate internships in 2018, and Andrew Harrington, the CS graduate internship coordinator, reports that there were 12 graduate internships. Internships were at companies ranging from startups like CocktailNapkin to major players like CNA, Bosch, the SEC, and the NSA. Internship activities ranged from website creation and improvements to full-stack software development and vulnerability tester.

EDITORIAL BOARDS
(Journals, Magazines, Technical Committees)

George K. Thiruvathukal, Associate Editor in Chief, IEEE Computer Magazine (flagship publication of the IEEE Computer Society)
https://www.computer.org/csdl/magazine/co

George K. Thiruvathukal, co-Chair, IEEE Special Technical Community on Broadening Participation
http://stcbp.org

George K. Thiruvathukal, Reproducible Research Department Editor, IEEE Computing in Science and Engineering
https://www.computer.org/csdl/magazine/cs

George K. Thiruvathukal, Editor, Journal of Open Source Software
https://joss.theo.j.org

Catherine Putonti, Senior Editor, Microbiology Resource Announcements, American Society of Microbiology
https://mra.asm.org/

STUDENTS

49 undergraduate internships
12 graduate internships
INDUSTRY-RELATED ACTIVITIES

Sammy Gorbett, a Professional Technical Recruiter, is helping our students with preparing for careers by teaching a course titled Computing Career Prep Seminar. She first taught a version of this well-received course in Fall 2018.

Robert Yacobellis is the CS Department’s Industry Liaison, and actively communicates job and internship and other opportunities to students and alumni; student jobs information can be found on the luc.edu/cs web page in the Jobs, Jobs, Jobs… area.

The CS Department has a Computer Science Program Advisory Committee (CS-PAC) consisting of members from industry and jointly hosted by the CS Department in collaboration with Loyola’s School of Continuing and Professional Studies (SCPS), ITS organization, and Quinlan Business School’s IS programs. The CS-PAC’s 6th meeting was held on October 22, 2018, and welcomed the Deans of the College of Arts and Sciences, the Quinlan Business School, and SCPS. This meeting reviewed the status of a key technology leadership proposal for computing, the CS Data Science Initiative, SCPS updates, and a potential mentoring program for CS-PAC members to become involved with; slides from that meeting can be found here.

FACULTY OUTREACH & CONSULTING

Chandra N Sekharan, ABET expert in Computer Science Accreditation Visits, 2018.

Peter L. Dordal, served as an IP consultant to a Chicago area law firm, 2018.
PROGRAM DIRECTORS

Ronald I. Greenberg is the Undergraduate Program Director (UPD) and also serves on the Academic Council

Andrew Harrington is the Graduate Program Director (GPD); Andy also manages the Association for Computing Machinery's (ACM's) yearly coding contest

Channah Naiman is the Graduate Program Director for IT (GPD/IT) and also serves on the Graduate Council

INTERDISCIPLINARY ACTIVITIES

Mark V. Albert, Adjunct Research Scientist, Center for Bionic Medicine, Shirley Ryan AbilityLab & Adjunct Assistant Professor, Department of Physical Medicine and Rehabilitation, Northwestern University Feinberg School of Medicine

Dmitriy Dligach, Affiliated with Boston Children’s Hospital and Loyola Stritch School of Medicine, is involved in a number of projects related to applications of machine learning and natural language processing to medicine

Catherine Putonti and Heather Wheeler are joint faculty with the Bioinformatics Program; Catherine is the Bioinformatics Program Chair

George K. Thiruvathukal and Nick Hayward are affiliated faculty with the Center for Textual Studies and Digital Humanities (CTSDH) and Dmitri Dligach and Konstantin Laufer are on the CTSDH Steering Committee; George was a co-founder of CTSDH in 2009

George K. Thiruvathukal is Visiting Faculty at Argonne National Laboratory, where he is involved in a number of projects related to high-performance computing, data science, and artificial intelligence.
STUDENT CLUBS AND ACTIVITIES

CS-STAC - Computer Science Student Advisory Council

CS Student Clubs
(at bottom of CS-STAC web page)

Spring 2018 CS Project Presentation winners: MixJIT: Jesse Meza and Samuel Habte, with advisor Chandra Sekharan. Volt Compiler: Nieky Allen with advisor Nick Hayward. Between these two groups they received 39 votes in an especially crowded field of 15 lighting presentations.

Summer Research Program: Under Mark V. Albert, the CS department combined several research efforts in summer 2018 to bring 28 students together in pursuit of 10 independent projects. Sixteen students were funded through the FYRE program (First Year Research Experience through Linda Brazdil’s HHMI grant) while 8 undergraduate students chose to use this experience as a stepping stone for their research efforts as part of independent study courses.

The program consisted of an intense initial period of twice-daily full program “huddles” to discuss daily plans and progress; this is in addition to daily project group meetings. Research posters were presented mid-way through the student efforts. All projects were designed to be furthered by either academic publication or clinical application after the summer effort.


The Data Science Club held its first meeting on Oct 12, 2018 attended by ten students with half the meeting as business and half as a short analytics competition.

A team from Loyola University Chicago, consisting of Taryn Chovan, Morgan Richardson, David Cheng, Devin Zayas, and Jess Conway, participated in the ?DoE CyberForce competition on December 1, 2018.
STUDENT AWARDS, ACM COMPETITION PERFORMANCE

The ACM Programming teams practiced 25 hours for the ACM Mid-Central Regional Programming Competition on Saturday November 3. The more experienced team of Jess Conway, Nick Predey and Jack West solved four problems. Only 32 of the 121 teams competing solved more problems. The team of Katherine Anderson, Stephanie Rodriguez and Ryne Storey were all still in Comp 271, where they have not yet studied the algorithms needed for many of the problems. They hoped to solve one and came away with two, and great experience to take into next year’s competition.

STUDENT THESES


Loyola Computer Science has an active CS Alumni LinkedIn Group here, managed by Robert Yacobellis.

Lorena Mora-Martinez, January 2018, Joined Microsoft as Technical Solutions Professional (Solutions Architect) for the U.S. Education team which supports K-12 and Higher Education institutions.


The Loyola Cybersecurity Club met for the first time on September 28, 2018, with a tutorial from alum Paul Stasiuk showing how to hack into machines. It was attended by over 15 students.