Allen V. R. Harper

Colby College
Department of Computer
Science 5850 Mayflower Hill
Waterville, Maine 04901

Phone: 207-859-5851
Fax: 207-859-5846
Office: Davis 330
aharper@colby.edu

Academic Positions

Colby College 2021 – Present
Department of Computer Science
Lecturer of Computer Science

Bowdoin College 2015 – 2021
Department of Computer Science
Visiting Assistant Professor

Teaching Appointments

Adjunct Instructor, New York University 2001-2011
Adjunct Lecturer, City University of New York 2001-2013

Education

Graduate Center, City University of New York, Dept. of Computer Science, New York, NY.
Doctor of Philosophy (Ph.D.), 2015.
Thesis: Eye Tracking and Performance Evaluation: Automatic Detection of User Outcomes
Advisor: Dr. Matthew Huenerfauth

Master of Philosophy (M. Phil.), 2012.

Brooklyn College, City University of New York, Dept. of Computer Science, New York, NY.
Master of Arts (M.A.), 2001

University of Rhode Island, Department of Geology, Kingston, RI.
Bachelor of Science (B.S), 1985

Publications

Peer-Refereed Papers, published in Conference Proceedings

Hernisa Kacorri, **Allen Harper**, Matt Huenerfauth. 2013. Comparing Native Signers Perception of American Sign Language Animations and Videos via Eye Tracking. In Proceedings of the 15th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS '13). ACM, New York, NY, USA, Article 9, 8 pages. DOI=10.1145/2513383.2513441

Book Chapters

Hernisa Kacorri, **Allen Harper**, Matt Huenerfauth. 2014 Measuring the Perception of Facial Expressions in American Sign Language Animations with Eye Tracking. International Conference on Universal Access in Human-Computer Interaction (UAHCI). Heraklion, Crete, Greece June 2014.

Theses/Other Publications

Harper, Allen V.R., (2015) "Eye Tracking and Performance Evaluation: Automatic Detection of User Outcomes". *Doctoral Dissertation*. CUNY Academic Works.
[https://academicworks.cuny.edu/gc_etds/964]

Harper, Allen V.R. (2011). Eye Tracking and User Performance Evaluation. *Literature Survey*, Computer Science, Graduate Center, City University of New York.

Assistantships, Awards and Scholarships

Teaching Fellow, CUNY Graduate Center, Department of Computer Science

Ten-Year Service Award, New York University, School of Continuing and Professional Studies
Research Assistantship, University of Rhode Island, Department of Economics
President's Award for Academic Excellence, University of Rhode Island, Dept. of Geology
US Navy ROTC Scholarship, Rensselaer Polytechnic Institute

Invited Presentations and Guest Talks

"Eye Tracking and Performance Evaluation: Automatic Detection of User Outcomes." April 2015. Invited Speaker, Seminar, Department of Computer Science, Bowdoin College, Brunswick, ME.

Past Professional Affiliations

Member of Association for Computing Machinery (ACM)

Special Interest Group on Accessibility and Computing (SIGACCESS)
Special Interest Group on Computer-Human Interaction (SIGCHI)
Special Interest Group on Computer Science Educations (SIGCSE)
Institute of Electrical and Electronics Engineers (IEEE)

Professional Service

Transactions on Computer-Human Interaction, External Reviewer (2018)

Student Research and Mentoring

Bowdoin College

Cobra Curtis (2020) Recipient of Gibbons Research Program Grant Title: Virtual Kent Island: Developing interactive virtual models for Bowdoin's historical environmental science research station Joint Mentors: Allen Harper, Visiting Assistant Professor of Computer Science, Department of Computer and Stacy Doore, Visiting Assistant Professor of Computer Science, Department of Computer

Sofía Hamby (2020) Recipient of Gibbons Research Program Grant Title: Ancient Archeological Site Data Visualized in a Virtual Environment Joint Mentors: Allen Harper, Visiting Assistant Professor of Computer Science, Department of Computer and Stacy Doore, Visiting Assistant Professor of Computer Science, Department of Computer

Eric Mercado (2016)
Recipient of Gibbons Summer Research Program Grant
Title: Machine Learning Analysis of Eye Tracking Data
Joint Mentors: Allen Harper, Visiting Assistant Professor of Computer Science, Department of Computer Science and Erika Nyhus, Assistant Professor of Neuroscience and Psychology, Department of Neuroscience

Independent Study
Michael DeFranco (Spring 2017)
Title: Computer Security
Student developed a plan of study in the area of "White Hat Hacking". Evaluation was based upon a survey paper of the topic and a set of practical lab exercises based on Kali Linux and Metasploit.

Teaching Experience
Colby College (2021-Present)
CS 152 Computational Thinking: Science (Lecture+Lab :11 semesters)
An introduction to computational thinking: how we can describe and solve problems using a computer. Using the Python language, students will learn how to write algorithms, manipulate information, and design programs. They will learn about abstraction, how to divide and organize a process into appropriate components, how to describe processes in a computer language, and how to analyze and understand the behavior of their programs. The projects focus on: (1) reading, writing, managing, and analyzing data; (2) modeling ecological systems using population and agent-based approaches; and (3) simulating physical systems with gravity and collisions. [Colby College Computer Science Department Course Catalog]

CS 231 Data Structures and Algorithms (Lecture:3 semesters Labs: 6 semesters)
Focuses on the common structures used to store data and the standard algorithms for manipulating them. Standard data structures include lists, stacks, queues, trees, heaps, hash tables, and graphs. Standard algorithms include searching, sorting, and traversals. Along with implementation details, students will learn to analyze the time and space efficiency of algorithms and how to select appropriate data structures and algorithms for a specific application. In homework, labs, and programming projects, students will implement their own data structures and make use of existing libraries to solve a variety of computational problems. [Colby College Computer Science Department Course Catalog]

Bowdoin College (2015-2021)

CSCI 1055 The Digital World (1 semester)
We are in the middle of a revolution where computers are changing every aspect of our life, from how we learn to how we communicate and interact. This course will explore the means and the results of the digital revolution. We will start with the question of how an analog world is made digital. Information must be coded and stored and the choices on how this is done have a strong impact on what follows. We will examine how information is used and how people interact with computers. We will then move on to how information is shared across networks and how it can be safeguarded. We will consider how the widespread transmission of data impacts societal issues such as privacy and intellectual property. Along the way we will do all of this through the lens of computer science, gaining insight into techniques such as programming and cryptography.

CSCI 1101 Introduction to Computer Science (3 semesters)
What is computer science, what are its applications in other disciplines, and what is its impact in society? A step-by-step introduction to the art of problem solving using the computer and programming. Provides a broad introduction to computer science and programming through real-life applications. Weekly labs provide experiments with the concepts presented in class. Assumes no prior knowledge of computers or programming.

CSCI 2101 Data Structures (7 semesters)
Solving complex algorithmic problems requires the use of appropriate data structures such as stacks, priority queues, search trees, dictionaries, hash tables, and graphs. It also requires the ability to measure the efficiency of operations such as sorting and searching in order to make effective choices among alternative solutions. Offers a study of data structures, their efficiency, and their use in solving computational problems. Laboratory exercises provide an opportunity to design and implement these structures.

CSCI 2330 Foundations of Computer Systems (1 semester)
A broad introduction to how modern computer systems execute programs, store information, and communicate. Examines the hardware and software components required to go from a program expressed in a high-level programming language like C to the computer actually running the program.

Topics include concepts of program compilation and assembly, machine code, data representation and computer arithmetic, basic microarchitecture, the memory hierarchy, processes, and system-level I/O. Regular, programming-intensive projects provide hands-on experience with the key components of computer systems.

CSCI 3300 Computer Networks (4 semesters)
Computer networks are everywhere: e-mail, the Web, wireless networks, mobile devices, networked sensors, satellite communication, peer-to-peer applications. New applications based on networks appear constantly. Introduces the exciting field of computer networks by taking a top-down approach. Begins with an overview of computer networks, hardware and software components, the Internet, and the concept of protocols and layered service. Delves into details about the four main layers making up the computer network stack: Application (HTTP, FTP, e-mail, DNS, peer-to-peer applications and socket programming), Transport (TCP, UDP, and congestion control), Network (IP, routers, and routing algorithms) and Link Layer and Local Area Networks (medium access control, switches, and Ethernet). Also covers wireless and mobile networks (CDMA, Wi-Fi, cellular internet access, mobile IP, and managing mobility).

City University of New York—Queens College
CSCI 240 Computer Organization and Assembly Language (3 semesters)
Undergraduate level course covering the principles of computer design and implementation. Students learn the basics of computer architecture and low-level programming. Topics include instruction set architecture and register-transfer level execution; storage formats; binary data encoding; bus structures; assembly language. MIPS programming language selected as implementation language for student projects.

CSCI 348 Data Communications (1 semester)
Undergraduate level course covering topic areas in computer communications and networks. Students learn the foundations of architecture, design and management of computer networks.
Topics include circuit types, data codes, synchronous and asynchronous transmission; protocols (OSI, TCP/IP); modems, multiplexors, and other network hardware; error correction and encryption; voice and data switching: local area networks, ISDN and packet switching. Java programming language selected as implementation language for student projects.

CSCI 744 Computer Architecture and Networks (1 semester)
Graduate level course covering topics in advanced analysis of computer architecture. Course builds on topics covered in CSCI 240 with more detailed and quantitative coverage. Topics include comparison of instruction set architectures (RISC, CISC, stack, and VLIW); the memory hierarchy, including cache design and performance issues, shared memory organizations, and bus structures. Models of parallel computing, including multiprocessors, multicomputers, multivector, SIMD, PRAM, and MIMD

architectures. Pipelining models, including clocking and timing, instruction pipeline design, arithmetic pipeline design, and superscalar pipelining.

CSCI 748 Computer Networks (4 semesters)
Graduate level course covering data communication and computer networks, including network hardware and software, as well as reference models. The OSI and the Internet (TCP/IP) network models are discussed. The course covers each network layer in detail moving from Physical layer to Application layer. Other topics include network security, encoding digital and analog signals, transmission media, protocols, circuit, packet, message, switching techniques. C and Java programming languages selected as the implementation languages for course projects.

NYC College of Technology, City University of New York, Dept. of Computer Science
CST 3613 Advanced Object-Oriented Programming in Java (2 semesters)
Second course in the three-course Object-Oriented Programming Module. Undergraduate level course intended to enhance students' understanding of object-oriented programming and to strengthen students' programming ability to develop advanced windowed applications. Additional focus on Java database connectivity. In this course, students will learn to build applications with advanced GUI components such as, menus, toolbar, dialogs and JTable, etc. and to learn how to connect the application with a database via SQL.

CST 4703 Unix Socket Programming (1 semester)
Undergraduate level course covering UNIX communications and networking. Topics include networking basics as applies to the UNIX operating systems, network file systems, modem and high-speed communications, UNIX communications programs, UUCP utilities, remote log-in programs, file transferring using FTP, the IP network addressing, the TCP/IP protocol stack and SNMP. In addition, students will be introduced to the Internet, electronic mail, telnet, gopher, Usenet, the World Wide Web and other on-line services. C programming language selected as implementation language for student projects.

CST 4713 – Application Architecture in Java (1 Semester)
Undergraduate level course introducing students to the role of Servlets and Java Server Pages (JSP). It provides instruction in building web pages dynamically, organizing projects into web applications, and deploying these applications using a web server, such as Apache Tomcat. The course presents role of Servlets as middleware in an N-tiered design structure (acting as a middle layer between requests coming from Web browsers or other HTTP clients and databases or applications on the HTTP server). The conceptual frameworks of the Servlet life cycle, handling client requests, generating server responses, handling cookies, session tracking, the proper uses of JSPs, and the integration of Servlets and JSPs using the MVC (model-view-controller) architecture are all discussed. Hands-on laboratory exercises reinforce the material presented in the lectures and enable students to develop related programming skills.

City University of New York—Baruch College
CIS 9365 Operating Systems Concepts (1 semester)
Graduate level course providing an in-depth study of the concepts underlying modern computer operating systems. Facilities and services provided by operating systems and their purpose and use in business information system environments are covered. Students learn how these facilities are incorporated into, and made available by, various types of operating systems, on a variety of computer hardware platforms. Hands-on system administration and programming exercises are used to support operating systems theory. Topics covered include operating system components, multiprogramming, multiprocessing, and multitasking system; virtual storage; interactive and batch processing; and file management facilities.

CIS 9771 Object-Oriented Programming II with Java (1 semester)
Special Topics elective at the graduate level representing the second course in a two-course sequence in object-oriented programming. This course covers advanced programming constructs needed to implement object hierarchies. Topics include Classes and Objects, OOP Inheritance and Polymorphism, Searching and sorting and Data Structures, File and Streams and Exception handling. Projects are designed and implemented illustrating the core concepts presented in the course.

City University of New York—Brooklyn College
CISC 1110 Introduction to Programming Using C (1 semester)
Undergraduate level course introducing students to programming as well as algorithm design and computers. Course covers writing, debugging, and testing programs; Loops and conditional control structures; Functions and parameter passing. Arrays, strings and simple memory management. Programming applications selected from various disciplines. History and basic concepts of computer science.

New York University (School of Professional Studies**)**
Java Environment Prep (9 semesters)
A two-day, hands-on workshop which prepares students entering the Java Certificate sequence. In this course students bring their laptops to NYU where all necessary Java software is installed and configured. This course was designed by me and other instructors for the purpose of streamlining the main Java sequence and assuring all instructors that their entering students were prepared to begin programming on the first class meeting.

Java Express (2 semesters)
Course is designed for individuals with previous experience in programming with C++, or a non-object-oriented programming language. Students learn about the similarities and differences between procedural and object-oriented languages as well the specifics of the Java Virtual Machine, Java APIs and Integrated Development Environment commonly used in Java development. Course prepares students to enter the SCPS Java Certificate sequence.

Introduction to Programming Using Java (8 semesters)
First of four required courses in the Java Programming Certificate sequence. Course covers the fundamentals of object-oriented programming and the Java programming language. Students learn programming concepts from data types, variable declaration, flow control structures, file management, exception handling, and graphical user interfaces. Concepts are reinforced with hands-on exercises and a final project. Course taught in laboratory setting.

Java I (2 semesters)
Course builds on prior programming experience in any language and provides a detailed introductions our knowledge with object-oriented programming in Java. Topics covered include abstraction, encapsulation, inheritance, polymorphism, interfaces, packages, garbage collection, exception handling, input/output, multithreaded programming, networking, utility classes, AWT, Swing, Applet, Java architecture, security, JDBC, and other features. Student projects are significantly more complex than those found in Introduction to Programming Using Java.

Java Summer Intensive (1 semester)
Two-week immersion course in Java technology. Typical student is coming from a project management background with a need for rapidly acquiring an understanding of Java technologies. The success of this course lies in the ability of the instructor to alternate between detailed coverage and high-level presentation in order to maintain forward momentum in the class.

Introduction to C Programming (1 semester)
This course introduces the fundamentals of the C programming language for students with little or no experience.

Social Justice Work Experience

Kings County District Attorney's Office
Principal Administrative Associate (PAA), Walk-In Center (2014-2015)
Conducted in-depth interviews with complainants who contacted the District Attorney's Office. Evaluated information gathered during the interview process to determine if complainant's issue was to be referred for either criminal or civil remedies. After conferencing with senior investigators developed referrals which were then thoroughly discussed with and explained to complainants. Detailed reports were generated after each interview identifying complainants and targets of the investigation as well as a succinct summary of the complaint.

Kings County District Attorney's Office
Technical Manager, Community-Based Programs (2007-2014)
Analyzed software requirements and developed specifications for database applications. Consulted with IT managers and programmers during implementation to assure software requirements are met. Coordinated, supervised hardware and software installations at remote sites assuring proper functioning of remote login and database software. Trained staff in remote login, security and data entry procedures.

Kings County District Attorney's Office (2001-2007)
Database Manager, Truancy Reduction Program
Consulted with Executive ADAs to establish software requirements of a novel truancy reduction initiative. Designed and implemented relational database systems using Access/SQL. Created flexible reporting framework which accommodated quick turn-around times to meet NYPD CompStat requirements.

Kings County District Attorney's Office (1996-2001)
Research Manager, Criminal Justice Education Program
Managed research component for a Law-Related education project which received $1.5M demonstration grant from the U.S. Department of Education (DOE). Responsible for the compilation of reports detailing preliminary research results to DOE in grant renewal applications. Developed and validated testing instruments. Conducted instrument administration, data collection and data analysis.

Kings County District Attorney's Office (1991-1996)
Research Programmer, Drug Treatment Alternative Program
Extensive SPSS programming and mainframe and PC database management. Journal research on attitudinal testing theory. Conducted post-sentencing and follow-up defendant interviews in support of U.S. Department of Justice longitudinal survey.

Academic References

Dr. Steven Majercik
Bowdoin College
Department of Computer Science
8650 College Station
Brunswick, Maine 04011 USA
(207) 798-3106
smajerci@bowdoin.edu

Dr. Matthew Huenerfauth
Golisano College of Computing and Information Sciences Department of Information Sciences and Technologies
Rochester Institute of Technology
Rochester, NY 14623
(585) 475-2459
matt.huenerfauth@rit.edu

Dr. Andrew Rosenberg
Department of Computer Science
Queens College
65-30 Kissena Boulevard
Flushing, NY 11367
(718) 997-3562
andrew@cs.qc.cuny.edu

Dr. Raquel Benbunan-Fich
Zicklin School of Business Baruch College
New York, NY 10010
(646) 312-3375
rbfich@baruch.cuny.edu