Mark Floryan

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University of Virginia
Department of Computer Science
85 Engineer's Way
Charlottesville, VA 22903

Education

University of Massachusetts: Amherst, MA
Fall 2008 – Spring 2013
M.S. / Ph.D. Computer Science
Ph.D. Advisor: Dr. Beverly Park Woolf

University of Virginia: Charlottesville, VA
Fall 2004 – Spring 2008
B.S. Computer Science

Appointments

Associate Professor; Academic General Faculty, Teaching Track; Computer Science *August 2020 – present*
University of Virginia; Charlottesville, VA

Assistant Professor; Academic General Faculty, Teaching Track; Computer Science *August 2013 – July 2021*
University of Virginia; Charlottesville, VA

HitPoint Studios, Inc. *March 2012 – August 2013*
Lead Game Developer

Lab Instructor; Computer Science *August 2011 – May 2012*
Mount Holyoke College; South Hadley, MA

Active Research Projects

ASCI@UVa: AI Smart-Classroom Initiative *August 2022 – present*
University of Virginia
This project aims to install a suite of AI-driven tools into the college classrooms to support scalability, community building, and course-specific scaffolding.

Advanced Collegiate Assessment System (ACAS) *May 2018 – present*
University of Virginia
This project aims to develop tools for scaling large courses, providing advanced assessments using graphical modeling of course content, and automatically generating feedback for student study as well as instructional design.

Gamification of Internet Interventions *April 2016 – present*
Game Design Research Group & Center for Behavioral Health Technology
This project involves the gamification of two active online internet interventions. One is an insomnia program for adults, the other a skin cancer prevention program.

Past / On-Hold Research Projects

Gamer Card: Gamification Platform for Education *August 2014 – present*
Game Design Research Group; University of Virginia

Gamifying the Process of Energy Saving *August 2015 – present*
Game Design Research Group; University of Virginia

Bookmark: Critical Reading Game *August 2015 – present*
Game Design Research Group; University of Virginia

Emergence: A Serious Game for Medical Diagnosis *May 2014 – present*
University of Virginia

Evolving Expert Knowledge Bases *August 2012 – Present*
University of Massachusetts, Amherst / University of Virginia

Dr. Doctor: A Knowledge Refinement Game *August 2012 – present*
University of Virginia / University of Massachusetts, Amherst

Rashi: Collaborative Tutoring in Ill-Defined Domains *January 2011 – Present*
University of Massachusetts, Amherst / University of Virginia

CIRCE: An Electronic Circuit Analysis Tutor *January 2011 – August 2013*
University of Massachusetts, Amherst

Examining Educational Benefits of Intelligent Interactive 3D Games *January 2010 – present*
University of Massachusetts, Amherst

4Mality: Intelligent Tutoring for Fourth Grade Standardized Math Tests *June 2010 – November 2010*
University of Massachusetts, Amherst

Nancy's Pantry: User Interfaces for the Blind *May 2007 - May 2008*
University of Virginia

Publications

Nada Basit, **Mark Floryan**, John Hott, Allen Huo, Jackson Le, Ivan Zheng. *"ASCI: AI-Smart Classroom Initiative"*. ACM Special Interest Group on Computer Science Education (SIGCSE) Technical Symposium. Pittsburgh, PA (2025). https://cra.org/resources/best-practice-memos/hiring-teaching-faculty-in-research-computing-departments/ (2024)

Jennifer Campbell, **Mark Floryan**, Geoffrey Herman, Michael Hilton, Jeremie Lumbroso. *"Best Practices for Hiring Teaching Faculty in Research Computing Departments"*. Computing Research Association (CRA) White Paper. https://cra.org/resources/best-practice-memos/hiring-teaching-faculty-in-research-computing-departments/ (2024)

Mark Floryan, Tom Horton, Zachary Bilmen*. *"Waypoints: A Mastery Learning Framework for Computer Science Courses at Scale – Implementation and Analysis"*. ACM Transactions on Computing Education (ACM TOCE) (In Revision).

John R. Hott, **Mark Floryan**, Nada Basit. *"Towards More Efficient Office Hours for Large Courses: Using Cosine Similarity to Efficiently Construct Student Help Groups"*. ACM Special Interest Group on Computer Science Education (SIGCSE) Technical Symposium. Portland, Oregon (2024).

Jim Bywater, **Mark Floryan**, Jennifer Chiu. "*DiSCS: A New Sequence Segmentation Method for Open-Ended Learning Environments*". 22nd International Conference on Artificial Intelligence in Education. Utrecht, The Netherlands (2021).

Mark Floryan, Philip I. Chow, Lee M. Ritterband, Stephen Schueller. "*The Model of Gamification Principles for Digital Health Interventions: Evaluation of Validity and Potential Utility*". Journal of Medical Internet Research 22.6. https://doi.org/10.2196/16506 (2020). E16506

Upsorn Praphamontripong**, Mark Floryan**, Ryan Ritzo*. "*A Preliminary Report on Hands-On and Cross-Course Activities in a College Software Testing Course*". 1st International Software Testing Education Workshop. Porto, Portugal (2020).

Mark Floryan, Lee M Ritterband, Philip I Chow. *"Principles of gamification for Internet interventions".* Translational Behavioral Medicine*, ibz041*. https://doi.org/10.1093/tbm/ibz041 (2019).

Nicholas Lytle, **Mark Floryan**, Tiffany Barnes. "*Effects of a Pathfinding Program Visualization on Algorithm Development*". ACM Special Interest Group on Computer Science Education (SIGCSE). Minneapolis, MN (2019).

Jim Bywater**, **Mark Floryan**, Jennifer Chiu, Jie Chao, Charles Xie, Camilo Viera, Alejandra Magana. "*Using Machine Learning Techniques to Capture Engineering Design Behaviors and Practices*". 13th International Conference of the Learning Sciences (ICLS). London, England (2018).

Nicholas Lytle*, **Mark Floryan**, David Amin*. "*Experience, Experiment, Evaluate: A Framework for Assessing Experiential Games*". International Journal of Serious Games 4.1 (2017): 15-30.

Toby Dragon, **Mark Floryan**, *Grayson Wilkins**, *Thomas Sparks**. "*Efficiency vs. Immersion: Design Trade-offs for an Exploratory Learning Environment*". ITS Workshop on Exploratory Learning Environments. Zagreb, Croatia (2016).

Mark Sherriff, **Mark Floryan**, *David Wert**. "*Achievement Unlocked: Investigating Which Gamification Elements Motivate Students*". 123rd Annual ASEE Conference and Exposition. New Orleans, LA (2015).

*Nicholas Lytle**, **Mark Floryan**. "*A Design Framework for Experiential Educational Games*". Proceedings of the Games and Learning Alliance (GALA) Conference. Rome, Italy (2015).

Mark Floryan, Toby Dragon, Nada Basit, Suellen Dragon, Beverly Park Woolf. *"Who Needs Help? Automating Student Assessment within Exploratory Learning Environments".* Proceedings of the 17th International Conference on Artificial Intelligence in Education. Madrid, Spain (2015).

Enid K. Sichel, Beverly Park Woolf, ***Mark Floryan***. *"Web-based Personalized Laboratories for Engineering Students"*. Proceedings of the 2014 Zone 1 Conference of the American Society for Engineering Education. Bridgeport, CT (2014). ****Nominated for Best Paper Award***

Enid K. Sichel, Beverly Park Woolf, ***Mark Floryan***. *"Personalized Intelligent Software Responses for Engineering Students"*. Proceedings of the 2014 IEEE-USA Annual Meeting and Innovations in Technology Conference. Providence, RI (2014).

Beverly Park Woolf, Winslow Burleson, Bradley Henry, ***Mark Floryan***, Avron Barr. *"White House Pull Mechanisms for Education"*. United States Office of Science and Technology Policy; Request for Information: Advancing Learning Technology through Pull Mechanisms. (2014).

Mark Floryan, Beverly Woolf. *"Improving the Efficiency of Automatic Knowledge Generation through Games and Simulations"*. Proceedings of the 16th International Conference on Artificial Intelligence in Education. Memphis, TN (2013).

Mark Floryan, Beverly Woolf. *"Authoring Expert Knowledge Bases for Intelligent Tutors through Crowdsourcing"*. Proceedings of the 16th International Conference on Artificial Intelligence in Education. Memphis, TN (2013). ****Best Poster Award Winner***

Mark Floryan. "*Evolving Expert Knowledge Bases: Applications of Crowdsourcing and Serious Gaming to Advance Knowledge Development for Intelligent Tutoring Systems*". Ph.D. Dissertation. University of Massachusetts, Amherst (2013).

Mark Floryan, Toby Dragon, Beverly Woolf. *"When Less is More: Focused Pruning of Knowledge Bases to Improve Recognition of Student Conversation"*. Proceedings of the 11th International Conference on Intelligent Tutoring Systems. Chania, Crete (2012).

Mark Floryan, Beverly Woolf. *"Students that Benefit from Educational 3D Games"*. Proceedings of the IEEE International Conference on Advanced Learning Technologies. Athens, GA (2011).

Mark Floryan, Beverly Woolf. *"Optimizing the Performance of Educational Web Services"*. Proceedings of the IEEE International Conference on Advanced Learning Technologies. Athens, GA (2011).

Mark Floryan, Beverly Woolf. *"Rashi Game: Towards an Effective Educational 3D Gaming Experience"*. Proceedings of the IEEE International Conference on Advanced Learning Technologies. Athens, GA (2011).

Toby Dragon, ***Mark Floryan***, Beverly Woolf, Tom Murray. *"Recognizing Dialogue Content in Student Collaborative Conversation".* Proceedings of the International Conference on Intelligent Tutoring Systems. Pittsburgh, PA (2010).

Mark Floryan, Beverly Woolf, Toby Dragon, Tom Murray. *"Interactive Event: Collaboration and Content Recognition Features in an Inquiry Tutor".* Proceedings of the International Conference on Intelligent Tutoring Systems. Pittsburgh, PA (2010).

Mark Floryan, Beverly Woolf, Rick Adrion. *"Web Services and Serious Games: The Applications of Web Based Software Engineering Techniques for the Purpose of Developing Game Based Intelligent Tutoring Systems."* (2010).

Mark Floryan, Beverly Woolf. *"A Literature Review of the Field of Serious Games."* (2009).

Mark Floryan. *"Consolidating and Deriving HCI Techniques for Non-Visual User Interfaces".* Honors Thesis. University of Virginia, University Press (2008).

** Indicates undergraduate student author at the time of writing ** Indicates graduate student author*

Talks

Mark Floryan*,* Lee Ritterband. "*Towards Improved Application of Gamification for Internet Interventions*". 9th Scientific Meeting. International Society for Research on Internet Interventions (ISRII). Berlin, Germany. October 12-14, 2017.

Mark Floryan *"Leveraging Computing to Provide Increased Efficacy for Educational Interventions"* University of Virginia; Center for Behavioral Health Technology Seminar. April 15, 2016.

Mark Floryan *"Video games and their applications to both teaching and learning."* University of Virginia; Student Game Developers Invited Talk. October 10, 2013.

Mark Floryan *"Automatic construction of knowledge bases from student data, and how gaming can affect this process".* McGill University. July 30, 2013.

Mark Floryan *"How can video games help humans and computers learn from one another?"* Mount Holyoke College. April 17, 2013.

Mark Floryan *"Life as a graduate student: What to expect."* Mount Holyoke College. October 11, 2011.

Grant Proposals

ASCI@UVa – AI Smart Classroom Initiative at UVa *2022 - 2024*
Mark Floryan, Robbie Hott, Nada Basit
UVa Educational Innovation Award
Amount: $101,441.60
Status: *Awarded*

Data Structures, Processing, and Analysis: A New CS Course for Non-Majors: *July 2017*
Thomas Horton, Mark Floryan
UVa Educational Innovation Award
Amount: ~$80,000
Status: *Awarded*

Improving Educational Fluency by Expanding Access to Automatic Reading Technologies *October 2013*
Mark Floryan, Maryam Ghariban, Hollis Cate, Vignesh Kuppusamy
Hereford Scholars Independent Project Grants
Amount: $2000
Status: *Awarded*

Teaching

University of Virginia *August 2013 – Present*

- CS 1501: Neural Networks in Application **Advisor of Student Taught Class*
- CS 1501: Cracking the Coding Interview **Advisor of Student Taught Class*
- CS 2150: Program and Data Representation
- CS 2190: Computer Science Seminar
- CS 2100: Data Structures and Algorithms I
- CS 3100: Data Structures and Algorithms II
- CS 3120: Theory of Computation
- CS 2501: Introduction to Game Design
- CS 3205: HCI in Software Development
- CS 4102: Algorithms
- CS 4710: Artificial Intelligence
- CS 4730: Computer Game Design

Mount Holyoke College *August 2011 – May 2012*

- CS 101: Introduction to Computer Science
- CS 201: Introduction to Software Engineering

University of Massachusetts, Amherst (Teaching Assistant) *August 2008 – December 2010*

- CS 121: Introduction to Solving Problems with Computers
- Java Enrichment Laboratory (Founder)

University of Virginia (Teaching Assistant) *January 2006 – December 2007*

- *CS 202: Discrete Mathematics*
- *CS 216: Data Structures*

Advising

ASCI: Motivating Students Data-Driven Quest Tasks *August 2023 – December 2024*
Senior Thesis Project
Carole Yin

Applying Game Theory to Group-Based Study Skills *August 2021 – May 2022*
Senior Thesis Project
Raneem Tarfa

Automatic Quizzing Software for Flexible Course Designs *August 2021 – May 2022*
Senior Thesis Project
George Taliaferro

Development of a Mastery-Learning Based Software System *August 2020 – May 2021*
Senior Thesis Project
Zachary Bilmen and Daniel Prohaska

Advanced Modeling of Mastery of College Quizzes *August 2019 – May 2020*
Senior Thesis Project
Carrington Murphy

A C++ Based 3D Game Engine for College Courses *August 2019 – May 2020*
Senior Thesis Project
Andrew Niedringhaus

Game Engine Special Effects in Javascript *August 2018 – May 2019*
Senior Thesis Project
Kasey Price

A Web-Based Tool for Rapid Game Engine Development Pedagogy *August 2018 – May 2019*
Senior Thesis Project
Laura Maimon

Studying the use of Virtual Reality for Promoting Positive Social Behaviors *August 2017 – May 2018*
Distinguished Majors Program; Capstone Project
Zachary Danz

Modeling Student Competency During CS Topics Practice *August 2017 – May 2018*
Distinguished Majors Program; Capstone Project
Rachel Pehrsson

Studying Competitive Features in a Gamified College Course *August 2016 – May 2017*
Senior Thesis Project
Joseph Baik; University of Virginia

Use of Virtual Reality for History Education *August 2016 – May 2017*
Senior Thesis Project
Anthony Uitz; University of Virginia

Gamifying an Insomnia Intervention for Older Adults *August 2016 – May 2017*
Senior Thesis Project
Cindy Park, Alyssa Lambert; University of Virginia

Developing Algorithms for Graph Combinations with Noisy Data *August 2015 – May 2016*
Senior Thesis Project
Ryan Duffin; University of Virginia

Prediction Algorithms for Forecasting NCAA Tournament Games *August 2015 – May 2016*

Independent Study Project
Max Reinsel; University of Virginia

Leveraging Social Game Mechanics to Enhance Mathematics Literacy *August 2014 – May 2015*
Senior Thesis Project
Courtney Maimon, Kevin Whelan; University of Virginia

The Dark Side of HCI; Analyzing Optimal Designs of Pirate Sites *August 2014 – May 2015*
Distinguished Majors Program; Capstone Project
Kevin Liu; University of Virginia

Machine Learning Algorithms for Categorizing User BAC Levels *August 2014 – May 2015*
Senior Thesis Project
Kyle Thornburgh, Praneeth Nadipalli, Sumit Narain; University of Virginia

Efficient Generation of a Medical Knowledge Base *August 2013 – May 2014*
Senior Thesis Project
Samuel Ogbe; University of Virginia

Decision Tree Modeling for ITS from Teacher Provided Data *August 2013 – May 2014*
Senior Thesis Project
Xinzhuo Dong; University of Virginia

Improved Designs for Knowledge Refinement Games *August 2013 – May 2014*
Senior Thesis Project
Tim Hammer; University of Virginia

Designing Games to Teach Domain Knowledge to Machines *August 2013 – May 2014*
Senior Thesis Project
Jared Baum; University of Virginia

The Addition of Haptic Feedback to LEAP Motion to Advance Desktop Interactions *August 2013 – May 2014*
Independent Research Project
Andy Barron, Justin Dao, Elizabeth Orrico, Alexander Kuck; University of Virginia

Automatic Grading Framework for Tutors in Ill-Defined Domains *August 2013 – May 2014*
Independent Research Project
Vishesh Choudhry; University of Virginia

CollegiateLoL: A Web-Based Collegiate E-Sports Management System *August 2013 – May 2014*
Independent Project
Garet Voit; University of Virginia

Circe: Introductory Circuit Analysis Tutor *August 2012 – May 2013*
Spiros Baltsavias; University of Massachusetts, Amherst

Professional Affiliations

Member: Association of Computing Machinery (ACM) *May 2016 – Present*

Member: International Society for Research on Internet Interventions (ISRII) *October 2017 – Present*

Member: Serious Games Society (SGS) *March 2016 – Present*

Member: Special Interest Group, Computer Science Education (SIGCSE) *February 2014 – Present*

Member of the International Artificial Intelligence in Education Society (AIED) *June 2013 – Present*

Service / Leadership

AGF Faculty Search Committee *2023 - 2024*
University of Virginia, Department of Computer Science

Treasurer: ACM Special Interest Group on CS Education (SIGCSE) *2024 - 2027*
Association of Computing Machinery (ACM)

CS Undergraduate Curriculum Committee (Chair) *2022 - Present*
University of Virginia; School of Engineering and Applied Science

Inter-Collegiate Programming Contest (ICPC) *2014 – Present*
Coach; University of Virginia
2023: World Finals; (Luxor, Egypt)
2014: World Finals; (Ural Federal University; Yekaterinburg, Russian Federation)
2016: World Finals (Prince of Songkla University; Phuket, Thailand)
2021: North American Divisionals; North American Championship (Orlando, FL USA)

Student Volunteer Co-Chair: ACM Special Interest Group on CS Education (SIGCSE) *2019 - 2023*
Association of Computing Machinery (ACM)

SEAS Undergraduate Curriculum Committee *2018 - Present*
University of Virginia; School of Engineering and Applied Science

Faculty Advisor: Alpha Phi Omega (APO) *2018 - Present*
University of Virginia

Academic General Faculty (AGF) Search Committee *2018 - 2019*
University of Virginia; Department of Computer Science

Program Committee: Special Interest Group on CS Education (SIGCSE) *2018 - 2019*
Association of Computing Machinery (ACM)

Data Structures and Analysis (DSA) I Sub-Committee (Chair) *2018 - 2019*
University of Virginia; Department of Computer Science

Member: Jefferson Scholars Foundation Selection Committee *March 2018*
University of Virginia; Jefferson Scholars Foundation

Program Committee: 14th International Conference on Intelligent Tutoring Systems (ITS) *July 2018*
Montreal, Canada

Reviewer: International Journal of Serious Games (IJSG) *August 2016 - Present*

ACM Student Chapter Faculty Advisor *August 2016 - Present*
University of Virginia

Program Committee: 13th International Conference on Intelligent Tutoring Systems (ITS) *July 2016*
Zagreb, Croatia

Program Committee: *July 2015*
6th International Workshop on Intelligent Support for Exploratory Learning Environments
Madrid, Spain

Undergraduate Curriculum Committee (UGCC) *August 2014 – Present*
University of Virginia; School of Engineering and Applied Sciences (SEAS)

Program Committee: 17th International Conference on Artificial Intelligence in Education (AIED) *July 2015*
Madrid, Spain

Program Committee: 12th International Conference on Intelligent Tutoring Systems (ITS) *July 2014*
University of Hawaii at Manoa; Honolulu, HI

Program Committee: 16th International Conference on Artificial Intelligence in Education (AIED) *July 2013*
University of Memphis; Memphis, TN

Program Committee: Workshop on Intelligent Support for Exploratory Learning Environments *July 2012*
Chania, Crete; Greece

Program Committee: 11th International Conference on Intelligent Tutoring Systems (ITS) *July 2012*
Chania, Crete; Greece

Volunteer: 10th International Conference on Intelligent Tutoring Systems (ITS) *June 2010*
Carnegie Mellon University; Pittsburgh, PA

New Student Committee; Social Committee; Message Meister *2008 - 2010*
University of Massachusetts, Amherst

Awards

All-University Teaching Award (Nominated) *2021 - 2023*
University of Virginia

Hartfield Jefferson Scholars Teaching Prize *2016-2017*
University of Virginia; https://www.jeffersonscholars.org/faculty-fellows

ACM Professor of the Year Award *2013 - 2014*
University of Virginia

Best Paper Award (Nominated) *May 2014*
Zone 1 Conference of the American Society for Engineering Education. Bridgeport, CT

Best Poster Award *July 2013*
16th International Conference on Artificial Intelligence in Education. Memphis, TN

Game Development Experience

Fablewood** *Release: November 2013*
A fantasy-based, social, hidden object game
HitPoint Studios Inc.
*(*https://goo.gl/3YM3T6*)*

Disney Fairies: Hidden Treasures* *Release: March 2013*
Story based adventure featuring Disney's *Tinker Bell*
HitPoint Studios Inc., Microsoft Game Studios, Disney Interactive Studios

Adera *Release: October 2012*
Story / puzzle based adventure game
HitPoint Studios Inc., Microsoft Game Studios, Disney Interactive Studios
(https://goo.gl/zqfHfo)

Seaside Hideaway** *Release: May 2012*
A seaside town based, social, hidden object game
HitPoint Studios Inc.
(https://apps.facebook.com/seasidehideaway/)

A Light in the Dark** *Release: January 2012*
Hide and seek game utilizing facial recognition technology
Independent: Mount Holyoke College Global Game Jam

Fruit Simon* *Release: January 2012*
A memory game utilizing physical motion based interaction
Independent: Mount Holyoke College Global Game Jam

Rashi Game** *Release: October 2011*
A 3-D medical diagnosis and inquiry based game
University of Massachusetts Amherst; Center for Knowledge Communication

*** Indicates lead role of given project*
** Indicates significant (non-lead) contribution to project*