Michael Ball | Curriculum Vitae

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Education

University of California, Berkeley **Berkeley, CA**
M.S. Computer Science, Advisor: Dr. Daniel Garcia *2015-2016*
Thesis: Lambda: An Autograder for Snap!

University of California, Berkeley **Berkeley, CA**
B.A. Computer Science *2011-2015*

Positions

UC Berkeley EECS, Data Science **Berkeley, CA**
Lecturer *Fall 2019 - Present*

Full-time lecturer, actively involved in EECS undergraduate curricular matters, and pedagogy.

Gradescope **Berkeley, CA**
Software Engineer *July 2016 – July 2021*

Early software engineer from startup through an acquisition by Turnitin. Responsible for web accessibility, conference presentations. Part time starting in Fall 2019.

UC Berkeley EECS **Berkeley, CA**
Researcher and Engineer *2016-2018*

Part-time role. Primarily focus on both Snap*!* and The Beauty and Joy of Computing projects.

Teaching — UC Berkeley

Course Descriptions

CS 10 *The Beauty and Joy of Computing* is a non-majors introduction to computer science. This is a hands-on project-based course taught using Snap*!* and Python. (4 units)

CS 88 / DATA C88C *Computational Structures for Data Science* is a CS1 or "1.5" course for data science majors. Based on Sussman's venerable SICP book, taught in Python. (3 units)

CS 169 *Engineering Software as a Service* The original software engineering course, later split into CS169A and CS169L. (4 units)

CS169A *Engineering Software as a Service* is an upper division course which focuses on the dynamics of modern software engineering through RESTful design, HTTP, and team projects. (4 units)

CS169L *Software Engineering Team Project* is a follow up CS169L, where teams of students get hands-on experience building a semester-long project for a campus organization or local nonprofit. (4 units)

CS W186 *Introduction to Databases* is an upper division databases course, offered in an online format. (4 units)

CS 194-23 *Art & Science of Digital Photography* is a highly technical photography course, bridging both art and engineering. (4 units)

CS 195 / CS H195 *The Social Implications of Computing Technology* is a course for students to explore the unintended consequences of computing, including the culture of how we build programs. H195 is an honors course where students complete a small research project. (1 unit / 3 units)

CS 294-188 *Design and Evaluation of CS at Scale* is a pedagogy course for teaching assistants designed to engage in course-course collaborations and learn about current computing education pedagogy. (1 unit)

CS 302 *Designing Computer Science Education* is a course which students take to prepare them to be the instructor of record for a summer CS course. (3 units)

CS 375 *Teaching Practicum* is the course all first time teaching assistants in computer science take. (2 units)

DATA 101 / CS C187 *Data Engineering* an upper division course putting databases into practice. Topics include SQL, window functions, indexing, design, ETL, NoSQL, graph databases, etc. (4 units)

Teaching Assignments

Notes:

- $*$ denotes courses which were co-taught.
- Spring 2020 included an abrupt switch to remote instruction.
- Fall 2020, Spring 2021 were entirely remote semesters.
- Fall 2021, Spring 2022, and Fall 2022 included significant hybrid teaching components.

- **Expected Fall 2024**
  DATA 101* (450 students), CS 169A (280 students)
- **Summer 2024**
  Co-Organizer EECS Summer Program (11 courses)
- **Spring 2024**
  DATA C88C (500 students, 14 Staff), CS 169L* (16 students, 2 staff), CS 302* (20 students, 0 staff)
- **Fall 2023**
  DATA C88C (460 students, 10 staff), CS 169A* (270 students, 6 staff)
- **Summer 2023**
  Organizer EECS Summer Program (10 courses)
- **Spring 2023**
  DATA C88C (500 students, 15 staff), CS 169L* (20 students, 1 TA), CS 302 (24 students, 0 staff)
- **Fall 2022**
  CS 88 (450 students, 14 staff), CS 169A* (240 students, 7 staff), CS 195/H195* (300 students, 1 TA)
- **Summer 2022**
  Co-Organizer EECS Summer Program (10 courses)
- **Spring 2022**
  CS 88 (420 students, 12 staff), CS 10 (150 students, 6 staff), CS 302* (25 students, 1 reader)
- **Fall 2021**
  CS 88 (400 students), CS 169A* (300 students), CS294-188 (10 students)
- **Spring 2021**
  CS 88 (400 students), CS 195 (400 students), CS169L* (60 students)
- **Fall 2020**
  CS 88 (360 students), CS 169A* (300 students)
- **Spring 2020**
  CS 88* (300 students), CS W186* (700 students), CS 195* (400 students)
- **Fall 2019**
  CS 88 (240 students, 8 staff), CS 169 (120 students, 4 staff), CS 375 (80 students)
- **Summer 2015**
  CS 10* (60 students, 5 staff)

- **Spring 2015**
  Head-TA, CS 10 (330 students)
- **Fall 2014**
  Head-TA, CS 10 (330 students)
- **Spring 2014**
  Head-TA, CS 10 (300 students)
- **Fall 2013**
  TA, CS 10 (300 students)
- **Spring 2013**
  TA, CS 194-23: The Art & Science of Digital Photography (30 students); TA, CS 10 (300 students)
- **Fall 2012**
  TA, CS 10 (240 students)

Awards

- UC Berkeley Lecturer Teaching Fellows, 2019-2020
  Year-long project on Parsons Puzzles in intro CS courses.

- Best Lightning Talk Award, 49th ACM Technical Symposium on Computer Science Education, 2018
  Awarded for the lightning talk ”IRT In 5 minutes”.

- Eugene L. Lawler Prize, UC Berkeley EECS, 2015
  The Lawler Prize honors computer science undergraduates from disadvantaged groups (such as the disabled community and ethnic minorities) or a person who has surmounted unusual difficulties in pursuing a degree with demonstrated academic effort. This prize was established by the UC Berkeley Computer Science Division to honor the memory of colleague, Professor Eugene L. Lawler, who was an internationally recognized expert in mathematical theories of scheduling and resource allocation. https://www2.eecs.berkeley.edu/Students/Awards/#11

- EECS Distinguished Graduate Student Instructor Award, 2015
  Faculty nominate the top nine percent of UC Berkeley EE or CS GSIs and Group Tutors from the semesters of the previous calendar year. From these, the EECS Student Awards committee selects one top EE and one CS GSI for the departmental award. Because EECS is a large department with about 180 GSIs per semester, it is a great honor to be selected as an Outstanding GSI. https://www2.eecs.berkeley.edu/

Grants and Gifts

- UC Berkeley Instructional Technology "Micro-grant" (2024-2025) Lisa Yan, **Michael Ball**. $50,000
  Following a successful first year, we were awarded subsequent funding and plan to continue the work with a focus on accessibility and sustainable maintance of tools.

- UC Berkeley Instructional Technology "Micro-grant" (2023-2024) Lisa Yan, **Michael Ball**. $50,000
  During a year-long pilot program through the Vice Provost's Office, we coordinated a team of students modernizing educational tools for CS and DS courses. Collaborated close with campus partners in Research, Teaching, and Learning to share custom tools with larger campus groups.

- UC Berkeley Presidential Chair Fellows (2021-2022) Pamela Fox, **Michael Ball**. $22,500
  UC Berkeley awarded a years-long grant through the Center for Teaching and Learning to add Parsons Problems to CS61A and CS88. Parsons Problems are interactive puzzles that lower the burden of memorizing syntax.

- Hopper Dean BJC 2020-2023 (Dan Garcia PI) $600,000
  The Hopper Dean foundation sponsored the development of the Beauty and Joy of computing curriculum. I helped create a new middle school, functional-first curriculum "BJC Sparks". I contributed engineering for a Spanish translation of our high school CS Principles course, and the Snap*!* programming language.

- NSF EAGER, Student Mission Control for the International Space Station (2021-2024), $298,944, Research Engineer (Dan Garcia co-PI) Funding to support development of an API, website, "Student Mission Control" interface, and curriculum modules centered on the data streaming out of the International Space Station. NSF Award #2027260

- UC Berkeley College of Engineering, Course Adaptation and Remote Delivery, Learning, and Assessment: Developing Question Generators and MOOC-like videos & quizzes for remote CS61C, CS10, and CS169A (2020), $60,000, Dan Garcia co-PI Funding to build Question Generators and MOOC-like videos and quizzes for CS61C and CS10 for remote delivery, learning, and assessment.

- Hopper-Dean Foundation, Accelerating CS Diversity Programs Fund (2019), $600,000, Dan Garcia PI The foundation granted $3M to the department to fund diversity initiatives; Summer salary was used to support our middle school curriculum, Spanish translation, software development and staff.

- Hopper-Dean Foundation ($200,000). 2016. Researcher. (Daniel Garcia, PI.)
  For the support of diversity initiatives in CS to support high schools nationwide. The High School Initiative focuses on high school computer science teachers, led by Professor Dan Garcia. In response

to NSF Program Manager Jan Cuny's charge to change the face of computing by engaging and preparing 10,000 teachers to teach computer science courses, Professor Garcia and colleagues have developed our non-major computer science class CS10: The Beauty and Joy of Computing (BJC) into a course that is fully aligned with high school Academic Placement (AP) specification. The plan is to accomplish this objective via an edX Small Private Online Course (SPOC) experience, with the high school teacher in control. The course recently received national exposure when it had more women than men in an intro CS course for the first time since records were digitized.

- Google CS Engagement Award ($5,000). 2015. Michael Ball.
  This gift from Google was used to support CS10 and The Beauty and Joy of Computing. The funds have been used to develop Snap*!* enhancements and help fund the Snap*!* Cloud infrastructure.

- Google's 3X in 3 Years (2015), $900,000, Student Researcher Authored By Dan Garcia. Funding to the department for 3-year project to grow undergraduate capacity and support diversity via our "Scaling Computer Science through Targeted Engagement" project. The three objectives are (1) Decrease the intro GPA gap between experienced and inexperienced students by 50%, (2) Increase Software Engineering and UI Design enrollment by 500 total students/year, and (3) Increase the number of women and underrepresented minority CS majors by a factor of 3.

- NSF STEM-C BJC4NYC: Bringing the Beauty and Joy of Computing to the Largest School System in the US ($7,874,876). 2014. Consultant.
  For the development of curricular materials, based on the Beauty and Joy of Computing, for teaching CS Principles at the high school level using the Snap*!* programming language. Development of the Snap*!* language, including the cloud back-end, and BJC curriculum software. l During the project, 100 high school teachers in New York City were trained to teach BJC, and early participants become teacher-trainers who worked with later participants. The teachers involved become part of a Community of Practice that continues to provide support for the teacher cohorts. I worked with EDC curriculum developers to review and suggest changes, developed BJCx (with auto-grading features) for teachers as a small private online course (SPOC), and (3) supported BJC teachers online.

- edX ($50,000). 2014. Staff.
  For the development of BJCx, a Computer Science Principles edX MOOC to be offered (1) as a synchronous Small Private Online Course (SPOC) for high schools, (2) a synchronous open-to-all MOOC for others, and (3) an asynchronous self-study course. The development concluded in creating four sub-MOOCs, which together was the sum of the BJC offering. I supported Snap*!* cloud integration, developed autograding (remote grading of Python and Snap*!* assignments and lab activities in a remove server) and an automated lab content builder, and supported BJC students and teachers in an online forum.

Research Interests

- **Computer Science Education**
  I am most experienced in high school, CS0 and CS1 courses. I am particularly interested in exploring

and improving structural issues in courses, such as sound principles for course policies, teaching with teams and effective use of education technology.

- **Digital Accessibility**
  I have experience building tools for software teams to improve the accessibility of web applications. I'm interested in improving methods for automatically detecting accessibility defects and recommending corrections. I am also interested in building accessible CS courses, and materials to teach accessibility to students.

Students Supervised

- May 2021: Alex Kassil "Active Academic Integrity"
  Co-advised with John DeNero
  https://www2.eecs.berkeley.edu/Pubs/TechRpts/2021/EECS-2021-157.html

- May 2020: Mansi Shah "Exploring the Use of Parsons Problems for Learning a New Programming Language"
  2nd Reader; advised by Dan Garcia
  https://www2.eecs.berkeley.edu/Pubs/TechRpts/2020/EECS-2020-88.html

- May 2020: Harikaran Subbaraj "Using Dataflow for Machine Learning Inference"
  2nd reader; advised by Joey Gonzalez
  http://www2.eecs.berkeley.edu/Pubs/TechRpts/2020/EECS-2020-75.html

Service

Professional Service

2024: SIGCSE Online: 2024 Posters and Lightning Talks Program Chair

2024: Snap*!*shot 2024 Co-Organizer; Technical Lead

2023: Snap*!*Con 2023 Co-Organizer; Technical Lead

2022: Snap*!*Con 2022 Co-Organizer; Technical Lead

2021: Snap*!*shot 2021 Mini-Conference Co-Organizer; Technical Lead, December 2021

2021: Snap*!*Con 2021 Co-Organizer; Technical Lead

2021: SIGCSE Technical Symposium Publicity Co-Chair

2021: SIGCSE Technical Symposium Associate Program Chair / Senior Reviewer "Experience Reports and Tools"

2020: Snap*!*shot 2020 Mini-Conference Co-Organizer; Technical Lead

2020: Snap*!*Con 2020 Co-Organizer; Technical Lea

2020: SIGCSE Technical Symposium Publicity Co-Chair

2018-2020: SIGCSE Technical Symposium Computer Science Principles Providers and Teachers Forum Co-Organizer
This forum was launched because there had been no formal face-to-face community for providers and teachers of CSP to discuss best practices, feedback, or share teaching experiences at SIGCSE.

2016 - 2020: SIGCSE Technical Symposium Reviewer

2018: SIGCSE Technical Symposium Photography Chair

Departmental & Institutional Service

2023 - 2024: UC Berkeley EECS Summer 2024 Instruction Co-Coordinator

Summer '24: Hired 10 Unit 18 Lecturers, involved in Union- and Campus-level negotiations

2023 - 2024: UC Berkeley Teach-Net Faculty Community Moderator

Campus-wide community of 1,000 faculty, staff, and administrators

2022 - 2023: UC Berkeley EECS Summer 2023 Instruction Coordinator

2019 - 2024: UC Berkeley EECS Undergraduate Study Committee

2021 - 2022: UC Berkeley EECS Summer 2022 Instruction Co-Coordinator

2021 - 2022: UC Berkeley: Research Teaching & Learning Faculty Advisory Committee, Co-Chair

2020 - 2023: EECS Department Student Grievances Committee, CS Chair

2021 - 2022: UC Berkeley: Research Teaching & Learning Faculty Advisory Committee, Co-Chair

2020 - 2021: UC Berkeley: Disabled Students Program Faculty Advisory Committee, Member

2020 - 2021: UC Berkeley: Research Teaching & Learning Faculty Advisory Committee, Member

Winter 2020 - 2021: UC Berkeley Working Group: Online Proctoring Policies, Member

Spring 2020: UC Berkeley Working Group: Best Practices for Remote Exams, Member

2016: UC Berkeley EECS Graduate Student Instructor Survey Presentation for Faculty

2014 - 2015: UC Berkeley EECS Undergraduate Study Committee, Student Member

Writing & Publications

Invited Talks, Workshops & Lectures

- Faberlull: Educational Programming Languages and Robotics VII, Invited Resident
  May 7-14, 2024, Olot, Spain
  https://faberllull.cat/en/residencia.cfm?id=43646

- Faberlull: Educational Programming Languages and Robotics VI, Invited Resident
  May 4-11, 2023, Olot, Spain
  https://faberllull.cat/en/residencia.cfm?id=42597

- ChatGPT What does it mean for Education? UC Berkeley Center for Teaching and Learning
  Invited Panelist, Feb 16, 2023

- UC Berkeley Vice Provost for Undergraduate Educations Remote Proctoring Session
  Online Workshop, Co-host. August 2022

- Invited participant Dagstuhl Seminar 22302 "Educational Programming Languages and Systems", July 2022 Wadem, Germany.
  https://doi.org/10.4230/DagRep.12.7.205

- UC Berkeley Vice Provost for Undergraduate Educations Remote Proctoring Session
  Online Workshop, Co-host. January 2022

- **Ball, Michael** and Garcia, Daniel. Online Learning (Talk). University of Washington CS Education Seminar, Online, 2020-05-28.

- **Ball, Michael** and Garcia, Daniel. Mastery Learning at Scale (Talk). University of Washington CS Education Seminar, Online, 2020-06-04.

Conference Papers

1. Garcia, Daniel; Fries, Mary; **Ball, Michael**; Fox, Pamela; Gelosi, Deanna; Mock, Lauren; Dastur, Della; Briccetti, Dave; Kahn, Bob
   BJC Sparks: A New Functional-First Middle School CS Curriculum
   In SIGCSE 2023: Proceedings of the 54th ACM Technical Symposium on Computer Science Education V. 2 March 2023.
   https://dl.acm.org/doi/10.1145/3545945.3569842x

Conference and Workshop Presentations

51. Garcia, Daniel; Fries, Mary; **Ball, Michael**; Mock, Lauren
    Igniting Curiosity with BJC Sparks: A Transformative Curriculum for Middle and High School

Computer Science (Workshop).
In SIGCSE 2024: Proceedings of the 55th ACM Technical Symposium on Computer Science Education V. 2 March 2024
https://doi.org/10.1145/3626253.3633415

50. Garcia, Daniel; Hug, Josh; Badrinathm, Anirudhan; **Ball, Michael**; Mock, Lauren
Student Mission Control: Integrating Space Data Exploration into Data and Computer Science Education (Workshop).
In SIGCSE 2024: Proceedings of the 55th ACM Technical Symposium on Computer Science Education V. 2 March 2024
https://doi.org/10.1145/3626253.3633417

49. **Ball, Michael**; Garcia, Daniel; Phelps, Victoria; Garcia, Yuan
Snap*!* 9 — Support for Teachers and Programming with Data (Demo).
In SIGCSE 2024: Proceedings of the 55th ACM Technical Symposium on Computer Science Education V. 2 March 2024
https://doi.org/10.1145/3626253.3635437

48. Walther, Kendra; Blank, Adam; **Ball, Michael**; Rampure, Suraj
A new class of Teaching-Track Faculty: No Ph.D. required (Panel).
In SIGCSE 2023: Proceedings of the 54th ACM Technical Symposium on Computer Science Education V. 2 March 2023.
https://doi.org/10.1145/3545947.3569608

47. Zhou, Lauren; Dewan, Akshit; Kothapalli, Anirudh; Fox, Pamela; **Ball, Michael**; Joseph, Thomas
Implementing Faded Parsons Problems in a Very Large CS1 Course (Poster).
In SIGCSE 2023: Proceedings of the 54th ACM Technical Symposium on Computer Science Education V. 2 March 2023.
https://doi.org/10.1145/3545947.3576300

46. Garcia, Daniel; **Ball, Michael**; Garcia, Yuan
Snap*!* 8—Smart Script Pics and Metaprogramming for All! (Demo).
In SIGCSE 2023: Proceedings of the 54th ACM Technical Symposium on Computer Science Education V. 2 March 2023.
https://doi.org/10.1145/3545947.3573231

45. **Ball, Michael**; Garcia, Daniel; Garcia, Yuan
10 Year of Snap*!*. Where should we go next? (Birds of a Feather).
In SIGCSE 2024: Proceedings of the 55th ACM Technical Symposium on Computer Science Education V. 2 March 2024

https://doi.org/10.1145/3545947.3573357

44. Walther, Kendra; Blank, Adam; **Ball, Michael**; Rampure, Suraj
A new class of Teaching-Track Faculty: No Ph.D. required (Panel).
In SIGCSE 2022: Proceedings of the 53th ACM Technical Symposium on Computer Science Education V. 2 March 2022.
https://doi.org/10.1145/3478432.3499227

43. Garcia, Daniel; **Ball, Michael**; Garcia, Yuan
Snap*!* 7 – Microworlds, Scenes, and extensions! (Demo).
In SIGCSE 2022: Proceedings of the 53th ACM Technical Symposium on Computer Science Education V. 2 March 2022.
https://doi.org/10.1145/3478432.3499266

42. **Ball, Michael**; Mock, Lauren; Garcia, Daniel; Barnes, Tiffany; Hill, Marnie; Fries, Mary; Fox, Pamela
Beauty and Joy Computing: AP CS Principles & Middle School Curriculum (Workshop).
In SIGCSE 2022: Proceedings of the 53th ACM Technical Symposium on Computer Science Education V. 2 March 2022.
https://doi.org/10.1145/3478432.3499145

41. Blank, Adam; Walther, Kendra; **Ball, Michael**
Teaching Track Faculty with a Masters-Only (BOF).
2021 Richard Tapia Celebration of Computing–Online

40. Mönig, Jens; Romagosa, Bernat; Harvey, Brian; **Ball, Michael**; Hügle, Jadga
What Might Be the Future of Snap*!*? (Panel) Snap!Con 2021. Online
https://www.snapcon.org/conferences/2021/program/proposals/295

39. Garcia, Daniel; Gelosi, Deanna; Fries; Mary; Fox, Pamela; **Ball, Michael**
BJC Middle School 1.0 (Panel) Snap!Con 2021. Online.
https://www.snapcon.org/conferences/2021/program/proposals/277

38. **Ball, Michael**; DeOrio, Andrew; Hsia, Justin; Blank, Adam
Teaching TAs to Teach: Strategies for TA Training. (Panel)
In SIGCSE '21: Proceedings of the 52nd ACM Technical Symposium on Computer Science Education March 2021, pp 461–462
https://doi.org/10.1145/3408877.3432579

37. Kassil, Alex; **Ball, Michael**

Active Academic Integrity (Poster)
in SIGCSE '21: Proceedings of the 52nd ACM Technical Symposium on Computer Science Education March 2021
https://doi.org/10.1145/3408877.3439674

36. **Ball, Michael**; Garcia, Daniel; Arvai, Eric
Effective Video Production for Online and In-Person Courses (Workshop).
In SIGCSE '21: Proceedings of the 52nd ACM Technical Symposium on Computer Science Education.
https://doi.org/10.1145/3408877.3432509

35. Lin, Kevin; Battestilli, Lina; **Ball, Michael**. Strategies for Authentic Assessments of Mastery in CS Courses (Birds of a Feather).
In SIGCSE '21: Proceedings of the 52nd ACM Technical Symposium on Computer Science Education March 2021
https://doi.org/10.1145/3408877.3439504

34. Hill, Marnie; Garcia, Daniel; Barnes, Tiffany; Mock, Lauren; **Ball, Michael**; Isvik, Amy; Bell, Dave
Teaching with the Beauty and Joy of Computing – AP CSP and More! (Workshop)
in Proceedings of the 52nd ACM Technical Symposium on Computer Science Education (SIGCSE '21)
https://doi.org/10.1145/3408877.3432507

33. Jens Mönig, Brian Harvey, Joan Guillén, Jadga Hügle, **Ball, Michael**; Bernat Romagosa, The Future of Snap! (Panel) Snap!Con 20202, Online. ://www.snapcon.org/conferences/2020/program/proposa

32. Garcia, Dan; **Ball, Michael**. 2020. Snap! v5, Our Biggest, Feature-filled Release Ever! (Demo) In Proceedings of the 51st ACM Technical Symposium on Computer Science Education (SIGCSE '20). Association for Computing Machinery, New York, NY, USA, 1417. https://doi.org/10.1145/3328778.3372

31. **Ball, Michael**, Lauren Mock, Dan Garcia, Tiffany Barnes, Marnie Hill, Alexandra Milliken, Joshua Paley, Efrain Lopez, and Jason Bohrer. 2020. The Beauty and Joy of Computing Curriculum and Teacher Professional Development (Workshop). In Proceedings of the 51st ACM Technical Symposium on Computer Science Education (SIGCSE '20)
https://doi.org/10.1145/3328778.3367029

30. **Ball, Michael**; Hsia, Justin; Pon-Barry, Heather; DeOrio, Andrew; Blank, Adam.Teaching TAs To Teach: Strategies for TA Training (Panel). SIGCSE '20: Proceedings of the 51st ACM Tech-

nical Symposium on Computer Science Education February 2020 https://doi.org/10.1145/3328778.3366987

29. **Ball, Michael**; Jatzlau, Sven; Snap*!*Con 2019 Lightning Talk: An Analysis of 500,000 Snap*!* Projects

28. **Ball, Michael** Snap*!* Con 2019 Lightning Talk Using JSFunction with the Wolfram Alpha API

27. Moënig, Jens; Romagosa, Bernat; **Ball, Michael**; Harvey, Brian; The Future of Snap*!* (Panel). Snap*!* Con 2019

26. **Ball, Michael**; Snap*!* A Look at 550K Projects. Poster. Snap!Con 2019, Heidelberg, Germany.

25. **Ball, Michael**; What's New in Snap*!* 5? Poster. Snap*!*Con 2019, Heidelberg, Germany.

24. **Ball, Michael**; A Look at 6 Years of the Snap*!*Cloud Snap*!*Con 2019, Heidelberg, Germany.

23. **Ball, Michael**; Romagosa, Bernat; Moenig, Jens; Harvey Brian. Snap*!* A Look at 5 Years, 250,000 Users and 2 Million Projects. Poster. Proceedings of the 50th ACM Technical Symposium on Computer Science Education.

22. Mock, Lauren; **Ball, Michael**; Garcia, Daniel; Barnes, Tiffany. 2019. Computer Science Principles Providers and Teachers Forum (Pre-Symposium Workshop). In Proceedings of the 50th ACM Technical Symposium on Computer Science Education (SIGCSE '19). Association for Computing Machinery, New York, NY, USA.

21. **Ball, Michael** Teaching Accessibility Using Software. What to Teach about Accessibility SIGCSE 2019 Pre-Symposium Event.

20. **Ball, Michael**. IRT in 5 Minutes: Easy Ways to Better Understand an Assessment. Lightning Talk. Proceedings of the 49th ACM Technical Symposium on Computer Science Education. http://doi.acm.org/10.1145/3159450.3162211

19. Galanos, Ria; **Ball, Michael**; Dougherty, John; Hummel, Joe; Malan, David. Technology We Can't Live Without!, Revisited. Panel. Proceedings of the 49th ACM Technical Symposium on Computer Science Education. http://doi.acm.org/10.1145/3159450.3159629

18. Milliken, Alexandra; **Ball, Michael**; Mock, Lauren. AP CS Principles and The Beauty and Joy of Computing Curriculum: Workshop. Proceedings of the 49th ACM Technical Symposium on Computer Science Education. http://doi.acm.org/10.1145/3159450.3162375

17. Garcia, Daniel; Harvey, Brian; Mönig, Jens; **Ball, Michael**; Romagosa, Bernat; Low, Robert; Mock, Lauren. The Beauty and Joy of Computing. Workshop. Scratch Conference 2017, Bordeaux, France, 2017-07-21.

16. **Ball, Michael**; Garcia, Daniel; Mock, Lauren. Writing Autograders for Snap*!* and Integrating them Into Your Course. Short Talk, Scratch Conference 2017, Bordeaux, France, 2017-07-20.

15. Garcia, Daniel; Harvey, Brian; Mönig, Jens; **Ball, Michael**; Mock, Lauren; Low, Robert; Romagosa, Bernat. The Beauty and Joy of Computing and the Snap*!* Programming Language. Poster. Scratch Conference 2017, Bordeaux, France, 2017-07-20.

14. **Ball, Michael**; Garcia, Daniel; Mock, Lauren. Early Analysis of ”In-Lab” Autograding for Snap*!*. Poster. Scratch Conference 2017, Bordeaux, France, 2017-07-20.

13. Mock, Lauren; **Ball, Michael**; Garcia, Daniel; Harvey, Brian. Lessons Learned Delivering a Customizable Course with Autograders to 200 Teachers. Ignite Talk. Scratch Conference 2017, Bordeaux, France, 2017-07-20.

12. Garcia, Daniel; Romagosa, Bernat; **Ball, Michael**; Mönig, Jens; Harvey, Brian. Programming the Internet (of things) with Snap*!*. Short Demo. Scratch Conference 2017, Bordeaux, France, 2017-07-19.

11. **Ball, Michael**. Writing Autograders for Snap*!* and Integrating Them Into Your Course. Demo. Proceedings of the 48th ACM SIGCSE Technical Symposium on Computer Science Education. http://doi.acm.org/10.1145/3017680.3022385

10. **Ball, Michael**. Implementing ”In-Lab” Autograding for Snap*!*. Poster. Proceedings of the 48th ACM SIGCSE Technical Symposium on Computer Science Education. http://doi.acm.org/10.1145/3017680.3022443

9. Garcia, Danieland **Ball, Michael**. Bringing the Beauty and Joy of Computing to the World via edX: An Experience Report. Panel. Scratch Conference 2016, Cambridge, MA, 2016-08-05.

8. **Ball, Michael** and Garcia, Daniel. Autograding and Feedback for Snap*!*: A Visual Programming Language. Poster. Proceedings of the 47th ACM Technical Symposium on Computing Science Education. http://doi.acm.org/10.1145/2839509.2850572

7. Garcia, Daniel; Barnes, Tiffany; **Ball, Michael**; Biga, Emil; Paley, Josh; Hill, Marnie; Mattix, Nathan; Safa, Parisa; Morris, Sean; Kenner, Shawn. AP CS Principles and The Beauty and Joy

of Computing Curriculum. Workshop. Proceedings of the 47th ACM Technical Symposium on Computing Science Education. http://doi.acm.org/10.1145/2839509.2844714

6. **Ball, Michael**. Using Instant Chat for Fun and for Profit to Run a Large Class. Abstract Only. Proceedings of the 47th ACM Technical Symposium on Computing Science Education. http://doi.acm.org/10.1145/2839509.2850526

5. Garcia, Daniel; Harvey, Brian; Moenig, Jens; **Ball, Michael**. The Beauty and Joy of Computing. Workshop. Scratch 2015, Amsterdam, Netherlands, August 12-16, 2015.

4. Garcia, Daniel; Harvey, Brian; Moenig, Jens; **Ball, Michael**. Bringing the Beauty and Joy of Computing to the World via edX. Special Session. Scratch 2015, Amsterdam, Netherlands, August 12-16, 2015.

3. Garcia, Daniel; Harvey, Brian; Moenig, Jens; **Ball, Michael**. The Beauty and Joy of Computing and the Snap*!* Programming Language. Poster. Scratch 2015, Amsterdam, Netherlands, August 12-16, 2015.

2. **Ball, Michael**; Mock, Lauren; McKinsey, Jonathan; Machardy, Zachary; Garcia, Daniel; Titterton, Nathaniel; Harvey, Brian. Oh, Snap*!* Enabling and Encouraging Success in CS1. Poster. Proceedings of the 46th ACM Technical Symposium on Computer Science Education. http://doi.acm.org/10.1145/2676723.2691947

1. Garcia, Daniel; **Ball, Michael**; Parikh, Aatash. L@S 2014 Demo: Best Practices for MOOC Video. Demo+Paper. Proceedings of the First ACM Conference on Learning @ Scale Conference. http://doi.acm.org/10.1145/2556325.2567889

Other Writing

- Engineering Software as a Service. 2nd. Edition Fox, Armando. Contributed Book Chapter on Accessibility.
  https://saasbook.info

- *AUTOGRADING FOR SNAP!* Hello World Magazine, Issue 3, Autumn 2017
  https://magazines-static.raspberrypi.org/issues/full_pdfs/000/000/004/orignal/HelloWorld03.pdf

- ”Where are the Practical Computing Classes?” The Daily Californian, Op-Ed Jan. 31, 2014
  https://www.dailycal.org/2014/01/31/practical-computing-classes/

Theses

- **Masters Thesis, 2016:** *Lambda: Autograding For Snap!*

Lambda is an autograding platform for Snap!, a blocks-based programming language. As an undergraduate, I contributed to designing the system, architecting code, and creating autograder tests for student projects. During my Master's Project, I created a server-side component for the autograder to support using LTI (Learning Tools Interoperability), an open educational standard, which allowed embedding the autograder into UC Berkeley's LMS. The autograder was used to trial a series of in-lab exercises, in comparison to the oral lab check-off questions students were answering.
http://www2.eecs.berkeley.edu/Pubs/TechRpts/2018/EECS-2018-2.pdf

Media and News

- CSEd Podcast: Guest Editor
  S3xE4: Accessibility with Richard Ladner
  https://csedpodcast.org/blog/season3_episode4/

- CSEd Podcast: Guest Host
  S3xE3: Undergraduate Teaching Assistants with Michael Ball
  https://csedpodcast.org/blog/season3_episode3/

- NPR: *Adding 'Beauty And Joy' To Obama's Push For Computer Science Teaching*. 2016-01-14.
  https://www.npr.org/sections/ed/2016/01/14/462954645/adding-beauty-and-joy-to-obamas-push

Software Projects

Snap*!*
Snap*!* is a blocks-based visual language designed to make teaching computer science easy, while exposing hard concepts like lambdas, recursion, and web APIs. I contribute to the core IDE, and I collaboratively designed, built and maintain the Snap*!* cloud-based project infrastructure, which currently supports more than 5 million projects and over 500,000 users.
https://snap.berkeley.edu

The Beauty and Joy of Computing
BJC is a university-level non-majors or a high school level AP Computer Science Principles course designed to broaden participation in computing. In addition to programming, the course emphasizes the context and implications of computing. I provide infrastructure maintenance, technical consulting and curriculum review. I contributed curriculum heavily to early versions of the course which are still used at UC Berkeley.
https://bjc.berkeley.edu

Alonzo, A Staff Chatbot
"Alonzo" is the name of a chatbot that course staff use to automate grading processes, saving time and reducing errors. The bot has been an integral part of enabling CS10 to facilitate in-class oral lab

check-offs by allowing Lab Assistants to easily enter check off data. The bot was originally started as a fun side project, but has since had multiple generations of TAs contribute to and maintain its code.
https://www.github.com/cs10/Alonzo

Downshift
Downshift is an open source React Component maintained by PayPal. I contribute accessibility enhancements and reviews.
https://github.com/paypal/downshift

Technical Skills

- **Programming Languages**: Snap*!*, JavaScript, Ruby, Python, SQL, bash, CSS, HTML
- **Development Tools**: Agile Development, git, React, accessibility testing and compliance, PostgreSQL, Amazon Web Services, Heroku, Terraform, software testing, continuous integration
- **Media Production**: Semi-Professional Photographer, Online events, audio recording, Final Cut Pro X, Adobe Creative Suite, Advanced Zoom programming

References

- Teaching Professor Dan Garcia
  ddgarcia@cs.berkeley.edu
  (510) 642-5775
- Associate Teaching Professor Josh Hug
  josh@joshh.ug
- Teaching Professor Emeritus Brian Harvey
  bh@cs.berkeley.edu
  (510) 642-8311
- Professor Armando Fox
  fox@berkeley.edu

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