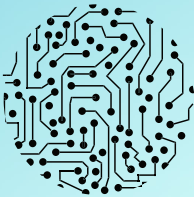


The Journal of Computing Sciences in Colleges



CCSC

CONSORTIUM FOR
COMPUTING SCIENCES
IN COLLEGES

ccsc.org

**Papers of the 36th Annual CCSC
Eastern Conference**

October 23rd-24th, 2020

Hood College

Frederick, MD

Volume 36, Number 3

October 2020

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Welcome to the 2020 CCSC Eastern Conference

On behalf of the CCSCE 2020 Conference Committee, we would like to extend a warm welcome to those attending this 36th Annual Conference.

This year's conference was scheduled to be held at Hood College in Frederick, Maryland. In light of a global pandemic, our options were to cancel the conference or find a different, safe venue. The organizing committee decided to move the conference online, and we are delighted to see the response and everyone's participation. It proves that CCSCE is not just a conference but a community. Besides being the first CCSCE held online, this conference is a real testament to our community's ability to problem-solve, persevere, and move forward in the face of adversity.

Thank you to the educators from all levels of the computing sciences, including computer science, information systems, information technology, and so on, and the students in the related fields for attending the conference and contributing to the success of this Eastern Region Conference.

With the contributions from many of you, we have two days of excellent programs planned for the professional enrichment of our audiences, which include an invited keynote, paper presentations, workshops, tutorials, poster presentations, and a programming competition for the students. This year the conference had 26 professional paper submissions, out of which we have accepted 14 papers for an acceptance rate of 54%. All papers underwent a double-blind review process with on average papers that were reviewed by 3 reviewers.

The conference is supported by faculty from multiple institutions who served on the Conference Committee, as reviewers, etc. We want to express our sincere gratitude to everyone involved in making this conference a reality. Special thanks to all those who helped develop the program, coordinate the paper reviews, organized the programming competition, coordinated the keynote speaker, managed the production of the proceedings, coordinated panels, workshops, tutorials, nifty ideas, and lightning talks. Our gratitude also goes to the judges for the poster awards, the session chairs, and student volunteers. We also appreciate the continuous effort and support from the CCSC Eastern Region Steering Committee, and we are very grateful for the generous supports of the CCSC National Partners, Sponsors, and Vendors.

Lastly, this conference is unique because we also have a bitter-sweet "change of guard." Our colleague, John Wright (Juniata College), who has been the steward of several CCSCE conferences over the years, is stepping down as the CCSC Eastern Representative. John's contributions to our community and the CCSCE conferences are innumerable, and his work and always helpful disposition has been nothing but exemplary. We thank him for his tireless support and welcome Mike Flinn (Frostburg State University) as the new Representative.

We hope you have an excellent and productive conference!

George Dimitoglou and Jiang Li
Conference Co-Chairs
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The "What's Next Economy"*

Keynote Address

Jonathan Aberman

*Dean, School of Business and Technology
Marymount University, Arlington, VA 22201*

The COVID-19 pandemic has changed our society and economy already, with many more challenges and changes to come. Jonathan Aberman, Dean of Marymount University School of Business and Technology is a national expert on innovation, economic trends and entrepreneurship. He believes that the United States has entered a new phase, which he describes as the "What's Next Economy?" He will discuss some of the hallmarks of the What's Next Economy and what it means for technologists, educators and policy makers.

Academic Credentials

Jonathan's academic qualifications are in the fields of economics and law. He earned BA degrees from George Washington University (Political Science and Economics) and Cambridge University (Law). He subsequently obtained a graduate degree in Economics from the London School of Economics (MSc in Economics). He completed his legal education at Cambridge University (MA) and New York University (LLM).

Speaker Bio

Jonathan Aberman is a highly respected thought leader on entrepreneurship and innovation. His experience as a venture investor, innovation consultant, university professor and media commentator gives him a 360-degree perspective on entrepreneurship and technology innovation. He is identified as a leader of change and influence in print and television media, recognized by Washingtonian magazine as a "Tech Titan," by the Washington Business Journal as a member of the "Power 100" and by the Commonwealth of Virginia as one of its "50 Most Influential Entrepreneurs" in the Commonwealth." Forbes Magazine described him as the "unsung hero" of the successful attraction of Amazon HQ2 to Arlington, Virginia.

Jonathan has unique expertise in the melding of national security and entrepreneurship with technology commercialization. He has worked on these matters with a number of national security agencies and universities including DOD Laboratory establishment, DARPA, the Air Force, the Army, the Department of Homeland Security, George Mason University and the University

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of Maryland at College Park. His activities regarding entrepreneurship and national security resulted in the formation of Tandem National Security Innovations, a national innovation community that has helped national security entities such as DARPA, DHS, SOCOM, JSOC and others find and engage with nontraditional sources of innovation.

Through his closely held investment business, Amplifier Ventures, Jonathan has helped to start 16 technology businesses since 2005. Among these businesses are successful companies in cybersecurity, mobile communications, internet and mobile content and software. Before starting Amplifier Ventures, he had a 15-year career as a partner and senior manager of a number of national law firms, and prior to that he was an associate in the investment banking industry in London, England. He uses his commercial experience to provide valuable strategic advice, business model and customer discovery acumen and deal management. His experiences and contacts in the venture capital industry inform his views on technology innovation and provide a hard earned commercial perspective that he applies to his work.

Jonathan is a committed educator. Prior to joining Marymount he spent 11 years as a Lecturer of Entrepreneurship at the University of Maryland's Smith School of Business, where he taught a broad range of courses including business formation, corporate finance, business strategy, and family entrepreneurship.

He also has a significant media footprint. He hosts What's Working in Washington, a podcast and weekly radio show on Federal News Network's WFED (AM 1500) examining innovation in one of the least understood business communities in the country. From 2015 until joining Marymount, Jonathan had a regular column, first in the Washington Post and then in the Washington Business Journal, covering the region's business community, innovation, entrepreneurship and economic development. He is often quoted in national publications including Bloomberg, CNN, Wall Street Journal and The New York Times, and he actively participates on panels and serves as a keynote speaker for innovation, entrepreneurship and technology events.

During his career Jonathan has helped to create many successful communities of entrepreneurs. In 2011, he founded Startup Virginia, Startup Maryland and StartupDC as part of the Obama Administration's StartupAmerica Initiative. These efforts resulted in the formation of regionally impactful programs including 1776 Accelerator and the iCorps program. In 2012 he formed FounderCorps, a not for profit that aggregated many of the Greater Washington region's most prominent entrepreneurs and promoted mentorship. In 2018, he formed the Tandem Product Academy, an educational program focused on teaching founders and senior executives essential skills necessary to scale technology product-based businesses.

Programming With the Cloud*

National Partner Session

Laurie White
Cloud DevRel
Google for Education

While there's a lot to learn about cloud computing, the cloud can also be used in classes as fundamental as programming courses with little change to the material being taught. The cloud can provide a uniform programming environment for students regardless of the computers they use to access it remotely. It can provide computing resources beyond what some students may have on their own computers. And there are even some cloud services that can be used to make even the simplest programming assignments more interesting.

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Techniques to Effectively Teach a Course Online*

National Partner Session

Yamuna Rajasekhar
zyBooks

With universities in the COVID environment moving to online instruction, many instructors are having to teach courses online. In order to achieve the same student performance as in-person instruction, instructors have to break away from conventional teaching methods and adapt their teaching techniques. This talk presents an overview of zyBooks, which are interactive, online textbooks for the STEM fields that have proven to increase student confidence in STEM courses. The talk also outlines techniques to make online instruction interactive and engaging for the student. Additionally, student performance results are presented from an online computer science course taught at the University of California, Riverside.

About the Speaker: Yamuna Rajasekhar received her Ph.D. in Electrical Engineering from the UNC Charlotte. She served as a faculty member at Miami University where her research was focused on assistive technology, embedded systems, and engineering education. She is currently a Content Developer at zyBooks, a startup that develops highly-interactive, web-native textbooks for a variety of STEM disciplines.

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