Mark Allen Weiss

Eminent Scholar Chaired Professor and Associate Director for Academic Affairs
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Overview

Mark Allen Weiss is Eminent Scholar Chaired Professor and Associate Director for Academic Affairs for the School of Computing and Information Sciences at Florida International University. He is also currently serving as Director of Undergraduate Studies. He received his Bachelor's Degree in Electrical Engineering from the Cooper Union in 1983, and his Ph.D. in Computer Science from Princeton University in 1987, working under Bob Sedgewick. He has been at FIU since 1987 and was promoted to Professor in 1996. His interests include data structures, algorithms, and education. He is most well-known for his highly-acclaimed Data Structures textbooks, which have been used by a generation of students.

Professor Weiss is the author of numerous publications in top-rated journals and was recipient of the University's Excellence in Research Award in 1994. In 1996 at FIU he was the first in the world to teach Data Structures using the Java programming language, which is now the de facto standard. From 1997-2004 he served as a member of the Advanced Placement Computer Science Development Committee, chairing the committee from 2000-2004. The committee designed the curriculum and wrote the AP exams that are now taken by 50,000 high school students annually.

Dr. Weiss' work has received over 2,000 citations according to Google Scholar, placing him in the top-30 in the "Computer Science Education" category and top-50 in "Data Structures". In addition to his Research Award, Professor Weiss is the recipient of the University's Excellence in Teaching Award and the School of Computing and Information Science Excellence in Teaching Award and Excellence in Service Award. He is a two-time winner of FIU's Top Scholar Award, a four-time winner of the internal competition for nomination as US Professor of the Year, and recipient of the 2017 FIU Torch Award. He is a Fellow of the American Association for the Advancement of Science (AAAS), an ACM Distinguished Educator, and recipient of both the 2015 ACM SIGCSE Award for Outstanding Contribution to Computer Science Education and the 2017 IEEE Computer Society Taylor L. Booth Education Award.

Education

1987	Ph.D. in Computer Science, Princeton University
1985	M.A. in Computer Science, Princeton University
1984	M.S. in Electrical Engineering and Computer Science, Princeton University
1983	B.E. in Electrical Engineering (Summa Cum Laude), The Cooper Union for the Advancement of Science and Art

Professional Experience

2009 - present	Associate Director for Academic Affairs, School of Computing and Information Sciences, Florida International University, Miami, FL.
2014 - present	Eminent Scholar Chaired Professor, School of Computing and Information Sciences, Florida International University, Miami, FL.
1996 - 2014	Professor, School of Computing and Information Sciences, Florida International University, Miami, FL.
1992 - 1996	Associate Professor, School of Computer Science, Florida International University, Miami, FL.
1987 - 1992	Assistant Professor, School of Computer Science, Florida International University, Miami, FL.
1984	Summer Intern, IBM Palo Alto
1982, 1983	Summer Intern, IBM Yorktown Heights

Honors and Awards

2017	IEEE Computer Society Taylor L. Booth Education Award: *Presented to only one individual annually. Citation: "For outstanding books, contributions to the Advanced Placement program, and their impact in the teaching of data structures and programming." IEEE has 400,000+ members and IEEE Computer Society is the largest IEEE society.*
2017	IEEE Region 3 Professional Leadership Award: *Citation: "For authoring textbooks that have had a profound impact on generations of students, for invaluable service to the computer science community, and for efforts in educating." Presented to one of the ~30,000 members of IEEE Region 3 for outstanding leadership efforts in advancing the professional aims of IEEE in the United States.*
2017	FIU Outstanding Faculty (Torch) Award: *Presented to a single faculty member annually who has made a lasting impression on the lives of FIU students and alumni. FIU has over 1,200 fulltime faculty members.*
2016, 2012	FIU Top Scholar
2015	ACM SIGCSE Award for Outstanding Contribution to Computer Science Education: *Presented to only one individual annually. Citation: "For authoring textbooks that have had a profound impact on generations of students and for invaluable service to the computer science education community." ACM has 100,000+ members and ACM SIGCSE is the third largest ACM SIG.*
2015-2012	FIU Nominee, U.S. Professor of the Year (4-time internal competition winner)
2012	Fellow, American Association for the Advancement of Science (AAAS). *Citation: "For distinguished contributions to the advancement of Computer Science education through his seminal books and curricular innovations that have impacted both high schools and colleges."*
2011	ACM Distinguished Educator
2007	FIU SCIS Excellence in Service Award
2005	FIU SCIS Excellence in Teaching Award
2004	College Board Certificate of Appreciation

2000	Data Structures and Algorithm Analysis textbook named one of the thirty most influential books of the twentieth century (ranked #13) by Dr. Dobbs
1999	FIU University Excellence in Teaching Award
1994	FIU University Excellence in Research Award
1994	FIU Teaching Incentive Program Award
1990	FIU Outstanding Achievement and Performance Award
1983	RCA Fellowship and Merit Prize to Princeton University
1981	New York City First Place Winner, Putnam Mathematics Contest

Administrative Experience

As Associate Director for Academic Affairs and Undergraduate Program Director of the School of Computing and Information Sciences since 2009, responsibilities include basic operations of the School's academic programs, serving over 2,000 students, with 30 tenured/tenure track faculty, 17 instructors, and roughly 35 adjunct faculty. Our School is among the top ten largest in the nation and has doubled in size. The overall annual budget is currently above $15,000,000, including nearly $5,000,000 in research expenditures, ranking FIU Computer Sciences #39 according to NSF. This position is equivalent to Associate Dean at almost any large university.

- Directly and singly responsible for obtaining over fifteen million dollars of state funding for programs that were ranked as #1 for program quality in the state by the Florida Board of Governors and served as the FIU lead in a joint effort with UCF and USF in the TEAm grant program, also ranked #1, resulting in an additional million plus dollar award.
- Created eleven new permanent instructor (including four female, six Hispanic), 25+ adjunct, and seven new permanent advisor positions.
- Led two successful ABET re-accreditations, that included creation of new direct assessments. **2016-17 Self-Study report was selected by ABET for display of well-prepared Self-Study Reports at the 2017 ABET Symposium, April 21-22 in Baltimore, MD.**
- Served as School's liason for SACSCOC accreditation, creating new SLO and PO assessments. **Received special letter of commendation from Vice Provost for efforts in successful fifth year mid-cycle review.**
- Created and implemented a peer teaching evaluation process for all non-tenured faculty.
- Led curriculum redesign of IT and CS degrees.
- Acquired 8,000 sq ft of new space for state-of-the art Tech Station facility that includes hardware and software labs, advising space, classroom space, and group work space.
- Acquired 5,000 sq ft of additional new space for the MERIT (**M**ultiuse **E**ducation, **R**esearch, and **I**nterdisciplinary **T**raining) center, to be completed Summer 2018.
- Increased School's 6-year FTIC graduation rate by over 20%.
- Instituted mechanism to verify prerequisites for students enrolled in the College of Engineering and Computing.
- Created all course schedules for 80 faculty per year.
- Handled advising, student grievances, and approved graduation certifications.
- Created a new B.A. in Computer Science degree, launching in Fall 2017.

Additionally, served concurrently as Graduate Program Director from 2009-2011 (i.e. both Undergraduate and Graduate Program Director, and Associate Director for Academic Affairs)

Grants

1. National Science Foundation 1643965/1643931/1643835: Collaborative Research: Florida-IT-Pathways to Success (Flit-Path) (lead institution, partnering with UCF and USF), 2016-2021, $4,998,732. FIU Share: $1,944,118. (Role: Lead PI, with co-PIs Z. Hazari, M. Ross, M. Bassiouni, M. Georgiopoulos, K. Christensen, R. Perez.)
2. An Urban University Coalition Response to Florida's Computer and Information Technology Workforce Needs (joint with UCF and USF) 2013-2015, $4,858,413 (FIU share: $1,533,596) (Role: FIU lead).
3. State of Florida IT Performance Funding Award, 2012-2016, $11,250,000 (Role: Institution lead).
4. National Science Foundation: CISE-EIA: *Development of an Institutional Infrastructure with Special Focus on Human-Computer Interfaces and Information Processing*, (co-PI with M. Adjouadi, A. Barreto, M. Martinez, A. Pasztor, G. Roig, M. Weiss, R. Coatie) Sep 1999 – Aug 2006, $1,437,770.
5. Defense Information Systems Agency: *Data Structures Using Ada9X*, 1994, $43,075.
6. FIU Foundation: Summer Research Grant, 1989, $10,350.
7. Florida State University Supercomputer Grant, 1988, $16,000.

Selected Publications

1. M. A. Weiss, “Data Structures, Past, Present, and Future,” Proceedings of the 46th ACM Technical Symposium on Computer Science Education, 2015 (Keynote address).
2. M. A. Weiss, *Data Structures and Algorithm Analysis in C++*, Addison Wesley, Reading, MA., 1994, 498 pgs. Second edition, 1999, 588 pgs. Third edition, 2007, 586 pgs. Fourth edition, 2014, 656 pgs.
3. M. A. Weiss, “Data Structures,” Handbook of Computer Science, CRC Press, Third Edition, 2014.
4. Robert K Lowery, G. Uribe, E. B. Jimenez, M. A. Weiss, K. J. Herrera, M. Regueiro, and R. J. Herrera, “Neanderthal and Denisova genetic affinities with contemporary humans: introgression versus common ancestral polymorphisms,” Gene, 530 (2013), 83-94.
5. M. A. Weiss, *Data Structures and Algorithm Analysis in Java*, Addison Wesley, Reading, MA., 1999, 542 pgs. Second edition, 2007, 546 pgs. Third edition, 2012, 614 pgs.
6. M. A. Weiss, *Data Structures and Problem Solving Using Java*, Addison Wesley, Reading, MA., 1998, 780 pgs. Second edition, 2002, 886 pgs. Third edition, 2006, 926 pgs. Fourth edition, 2010, 988 pgs.
7. M. A. Weiss, “Parameter Passing,” Encyclopedia of Computer Science and Engineering, Wiley, 2009.
8. S-C. Chen, X. Wang, N. Rishe, and M. A. Weiss, “A Web-Based Spatial Data Access System Using Semantic R-Trees,” *Information Science: An International Journal*, 167 (2004), 41-61.
9. M. A. Weiss, “STL,” Handbook of Data Structures and Applications, CRC Press, 2004.
10. M. A. Weiss, *C++ for Java Programmers*, Prentice-Hall, Upper Saddle River, NJ, 2004, 280 pgs.

11. M. A. Weiss, *Data Structures, and Problem Solving with C++*, Addison Wesley, Reading, MA., 1996, 820 pgs. Second edition, 2000, 944 pgs.
12. O. Astrachan, G. Chapman, S. Rodger, and M. A. Weiss, "The Reasoning for The Advanced Placement C++ Subset," *SIGCSE Bulletin* (1997), 62-65.
13. M. A. Weiss, "Experiences Teaching Data Structures with Java," *SIGCSE Bulletin* (proceedings of the 28th SIGCSE Technical Symposium), (1997), 164-168.
14. M. A. Weiss, *Operating Systems*, article published as part of *Microsoft's Encarta Encyclopedia*, 1997.
15. M. A. Weiss, *Data Structures and Algorithm Analysis in C*, Addison Wesley, Reading, MA., 1993, 461 pgs. Second edition, 1997, 512 pgs.
16. S. Guo, W. Sun, and M. A. Weiss, "On Solving Satisfiability, Implication, and Equivalence Problems Involving Conjunctive Inequalities in Database Systems," *IEEE Transactions on Knowledge and Data Engineering* 8 (1996).
17. S. Guo, W. Sun, and M. A. Weiss, "Solving Satisfiability and Implication Problems in Database Systems," *ACM Transactions on Database Systems* 21 (1996), 270-293.
18. M. A. Weiss, "Shellsort with a Constant Number of Increments," *Algorithmica*, 16 (1996), 649-654.
19. M. A. Weiss, *Data Structures and Algorithm Analysis in C*, published as part of the *Dr. Dobbs CD on Essential Algorithms*, 1996.
20. M. A. Weiss, *Efficient C Programming: A Practical Approach*, Prentice-Hall, Englewood Cliffs, NJ., 1995, 528 pgs.
21. M. A. Weiss, *Data Structures and Algorithm Analysis*, Benjamin/Cummings Publishing Co., Redwood City, CA., 1992, 455 pgs. Second edition, 1995, 510 pgs.
22. W. Sun and M. A. Weiss, "An Improved Algorithm for Implication Testing Involving Arithmetic Inequalities," *IEEE Transactions on Knowledge and Data Engineering* 6 (1994), 997-1001.
23. Y. Ding and M. A. Weiss, "On the Complexity of Building an Interval Heap," *Information Processing Letters* 50 (1994), 143-144.
24. M. A. Weiss, "On Finding the Height of a Binary Search Tree," *Computer Journal* 36 (1993), 280-281.
25. Y. Ding and M. A. Weiss, "The Relaxed Min-Max Heap: A Mergeable Double-Ended Priority Queue," *Acta Informatica* 30 (1993) 215-231.
26. Y. Ding and M. A. Weiss, "The k-d Heap: An Efficient Multi-Dimensional Priority Queue," *Proceedings of the Third Workshop on Algorithms and Data Structures*, Montreal Canada, Aug. 1993, Springer-Verlag Lecture Notes #709, 303-314.
27. C. Orji, J. Solworth, and M. A. Weiss, "Improved Traditional Mirrors, " *Proceedings of the Fourth International Conference on Foundations of Data Organization and Algorithms*, Chicago Illinois, Oct. 1993, Springer-Verlag Lecture Notes #730, 329-344
28. M. A. Weiss, *Data Structures and Algorithm Analysis in Ada*, Benjamin/Cummings Publishing Co., Redwood City, CA., 1993, 480 pgs.
29. Y. Ding and M. A. Weiss, "Best Case Lower Bounds for Heapsort," *Computing* 49 (1992), 1-9.
30. B. Feild, G. Fraguio, J. K. Navlakha, and M. A. Weiss, "Expert Systems and Music: Translating Piano Music into Guitar Chords," *Advances in Artificial Intelligence Research, Volume II*, JAI Press, 1992.

31. M. A. Weiss, “Empirical Study of the Expected Running Time of Shellsort,” *Computer Journal* 34 (1991), 88-91.
32. M. A. Weiss and R. Sedgewick, “Tight Lower Bounds for Shellsort,” *Journal of Algorithms* 11 (1990), 242-251.
33. M. A. Weiss and R. Sedgewick, “More On Shellsort Increment Sequences,” *Information Processing Letters* 34 (1990), 267-270.
34. M. A. Weiss and J. K. Navlakha, “The Distribution of Keys in a Binary Heap,” *Proceedings of the Workshop on Algorithms and Data Structures*, Ottawa Canada, Aug. 1989, Springer-Verlag Lecture Notes #382, 510-516.
35. M. A. Weiss and R. Sedgewick, “Bad Cases for Shaker Sort,” *Information Processing Letters* 28 (1988), 133-136.
36. M. A. Weiss and R. Sedgewick, “Tight Lower Bounds for Shellsort (extended abstract),” *Proceedings of the Scandinavian Workshop on Algorithms and Theory*, Halmstad Sweden, July 1988, Springer-Verlag Lecture Notes #318, 255-262.

Panel Discussions

1. M. Stehlik, S. Fix, S. H. Rodger, C. Nevison, M. A. Weiss, “Advanced Placement Transition to C++,” SIGCSE 1998.
2. T. Dick, R. Peck, M. A. Weiss, “AP and College Faculty: What’s in it for me?,” ICTCM 2000.
3. D. Gries, K. Larson, S. H. Rodger, M. A. Weiss, U. Wolz, “AP CS Goes OO,” SIGCSE 2001.
4. R. L. S. Drysdale, J. Hromcik, M. A. Weiss, R. Hahne, “Java in the Morning… Java in the Evening… Java in 2004,” SIGCSE 2003.

Professional Activities

1. Member ACM Education Council (2016-)
2. Elected Member ACM SIGCSE Advisory Board (2016-2019)
3. Advisory Board Member, IEEE- International conference on Emerging Computation and Information Technology (ICECIT-2017)
4. Interim Educational Activities Chair, IEEE Education Society Florida Chapter (2016-)
5. Program Committee Member ACMSE (2006)
6. Computer Science Discipline Coordinator, Florida Department of Education (2011-)
7. Member (1997-2004) of the *Advanced Placement Computer Science Development Committee*; Chairperson of the committee (2000-2004).
8. Member (1999-2000) of the *Ad-Hoc Committee* on the Future of the Advanced Placement Examination.
9. Member (1995-1996) of the *Ad-Hoc Committee* that advised the College Board on how to incorporate C++ into the Advanced Placement Exam. (This committee did not recommend the switch from Pascal to C++.)
10. Reader (1999) of the *Advanced Placement Computer Science Examination*.
11. Columnist (1992-1997) for the *ACM SIGACT News*. The *Journal Backlog Report* and *Technical Report Column* were regularly appearing features.
12. Examiner for the Educational Testing Service: I have written questions for the Computer Science GRE Examination.

13. Registration Chair for PDIS I, 1991.
14. Judge for the International Science and Engineering Fair, Orlando, 1991.

University Service

1. Member, Faculty Senate (Spring 1991-1992, 2015-)
2. Member, Council of College Research & Graduate Education Administrators (2017-)
3. Member, University Student Success Committee (2016-)
4. Member, University Sustained Performance Evaluation Policy Committee (2015-)
5. Member, American Disabilities Act Compliance Subcommittee (2012-2013)
6. Inaugural Member, University Graduate School Advisory Committee (2011-)
7. Member, College of Engineering and Computing 25th Anniversary Committee (2009)
8. Member, University Sabbatical Leave Committee (2008-2009)
9. Member and Chair, College of Engineering and Computing Committee on Tenure Revision Guidelines (2007)
10. Member, College of Engineering and Computing Committee on Implementing the New Class Schedule (2006-2007)
11. Member and Vice Chair, College of Engineering and Computing Faculty Council (2006-2007)
12. Member, University Tenure and Promotion Policy Committee (1998-1999)
13. Member, University Curriculum Committee (1998-1999)
14. Procedural Committee, College of Arts & Sciences (1991-1992, (chair) 1992-1995)
15. Secretary, College of Arts & Sciences (1992-1994)
16. Member, University Academic Policies Committee (1991-1993)
17. Editor of UFF Newsletter (1989-1991)
18. Member, College of Arts & Sciences Library Committee (1987-1989)

School of Computing and Information Sciences Service

1. Undergraduate Program Director (2009-)
2. Graduate Program Director (1994-1996, 2009-11)
3. Human Resources (Tenure and Promotion) Committee (1989-1990, 1992-1995, (chair) 1996-1997, 2002-2004, (chair) 2006-2007, (chair) 2008-2009)
4. Graduate Committee (1988-1990, 1991-1992, 1994-1996)
5. Curriculum Committee ((chair) 1998-1999, (chair) 2001-2002, (chair) 2003-2004, 2004-2005)
6. Recruitment Committee (1989-, (chair) 1990-1992, (chair) 1997-1998, (chair) 1999-2001, (chair) 2002-2003, 2006-2007)
7. Equipment Committee ((chair) 2004-2006)
8. Awards Committee ((chair) (2006-2007, 2008-2009))
9. Editor CONNECT Newsletter (1996-1997)
10. TIP Award Committee (1996)
11. Faculty Advisor for Programming Team (1990-1991) (with M. Milani) team was second in region and advanced to ACM Finals.
12. Colloquium Series Coordinator (1990-1991, 1997-1998)

Master's Thesis Supervision

1. Xinwei Cui, “Using Genetic Algorithms to Solve Combinatorial Optimization Problems,”1991
2. Xiao Sheng, “Implementation of the *k*-d Heap,” 1996
3. Yuping Huang, “Comparison of Searching Algorithms,” 1996

Courses Developed

1. Topics in Algorithms (Spring 1989)
2. C for Engineers (Fall 1991)
3. Programming III (Spring 2002)
4. Algorithm Techniques (Spring 2012)
5. Discrete Structures (Fall 2016)

Courses Taught

1. Introduction to Programming (COP-2210)
2. C for Engineers (CGS-3423)
3. Programming II (COP-3212/COP-3337)
4. Intermediate Java Programming (COP-3804)
5. Advanced Programming (COP-3223/COP-3338)
6. Data Structures (COP-3530, recent sections recorded)
7. Unix Systems Programming and C (COP-4225)
8. Programming III (COP-4338)
9. Topics in Algorithms (COT-5992/COT-5936/COT-6936)
10. Analysis of Algorithms (COT-6315/COT-6400/COT-6405)
11. Computer Data Analysis (CGS-2100, fully online)
12. Introduction to Algorithms (COT-5407, some sections fully online)
13. Algorithm Techniques (COP-4534, recent sections recorded)