Prof. Anat Bremler-Barr

1 Personal Information

Prof. Anat Bremler-Barr
Blavatnik School of Computer Science
Tel-Aviv University

Office: 252 Check Point Building
Office phone: +972-73-380-4215
E-Mail: anatbr@tauex.tau.ac.il
Homepage: `https://deepness-lab.org/prof-anat-bremler-barr//`
Marital status: married+2.

2 Research Interests

Networking: Network Algorithmics, Routing, IP-lookup and Classification, Network Measurements, Network Function Virtualization (NFV), Software Defined Networking (SDN), Cloud.
Network Security: Denial of Service (DDOS), DNS security, IoT security.

3 Education

2002 Ph.D.: Computer Science, Tel Aviv University, Israel
Thesis title: *" Algorithm for Efficient and Reliable Routing in the Internet"*.
The title was awarded with **distinction**.
Advisor: Prof. Yehuda Afek

1997 M.Sc : Computer Science, Tel Aviv University, Israel
Graduated with honors (Summa Cum Laude)

Thesis title:*"Self-Stabilizing Unidirectional Network Algorithms by Power Supply "*.
Advisor: Prof. Yehuda Afek

1994 B.Sc.: Mathematics and Computer Science, Tel Aviv University, Israel
Graduated Magna Cum Laude

1999 LL.B: Law, Tel Aviv University, Israel

4 Academic and Professional Appointments

4.1 Tel-Aviv University

- 2023-Current: Head of Kipp Institute of Computer Networks
- 2023-Current: Full Professor
- 2013-2022: Visiting Professor Computer Science, Tel-Aviv University

4.2 Reichman University

- 2019-2021: Vice Dean
- 2020 -2022: Full Professor
- 2019- 2022: Academic Director (and founder) of CONNECT Industrial Affiliation Program (IAP)
  `https://www.runi.ac.il/schools/computer-science/connect-program`
- 2013-2020: Associate Professor
- 2010-current: Founder and director of the Deepness-lab, `https://deepness-lab.org/`
- 2007-2013: Senior Lecturer
- 2006-2020: Academic Director of the Security Specialty
- 2003-2007: Lecturer

4.3 Industrial Experience

- 2022: **Sabbatical at RedHat Research**

- 2001 - 2004: **Riverhead Networks, Chief Scientist and Co-founder** - One of the inventors of the fundamental technology of the company. Riverhead Networks developed advanced solutions for Distributed Denial of Service attacks (DDoS). The company was acquired by CISCO in 2004.
- Advisor of start-up companies.
- 2000: Summer Internship at AT&T Menlo Park under the supervision of Dr. Edith Cohen.

5 Professional Activities

- Associate Editor ACM Transactions on Privacy and Security 2024
- SIGCOMM 2022 workshop chair
- 2017- Current: Editor at Large of IEEE/ACM Transactions on Networking
- 2013-2017: Associate Editor of IEEE/ACM Transactions on Networking (number 1 networking journal).
- Conference Program Committee: CCS 2024, INFOCOM 2008-2024, IMC 2023, PODC 2008,2011,HPSR 2010-2013,Networking 2013,2021, DISC 2013,ICNP 2014, CSCML 2017-2018, CANS 2020
- Co-organizer (with Prof. Isaac Keslassy) of Israeli Networking Day 2007. Steering Committee Israeli Networking Day 2021-2022.
- Reviewers for the following journals: IEEE Transactions on Parallel and Distributed Systems, IEEE Transactions on Computers, Theoretical Computer Science, Computer Networks, IEEE Transactions on Dependable and Secure Computing, IEEE Transactions on Networking, IEEE Communication letters.
- ACM and IEEE member
- Industrial Conferences:
  - Co-organizer of the Panel on the Biometry Repository, September 2009, where ministers and researchers from computer science and social science presented their opinion about the Knessset's (the Israeli legislative authority) attempts to legislate the Biometry Repository Law.
  - Co-organizer of OWASP-IL (Open Web Application Security Project) Conference at IDC years 2007-2014 - The conference was attended by 250 people from the application security industry.

6 Selected Invited Talks

The list includes only talks which are not part of a conference in which papers were published.

- ”Bringing Order To BGP: Decreasing Convergence Message Complexity”, CS colloquium, Technical University of Darmstadt, Germany, 2009
- ”Accelerating Multi-Patterns Matching on Compressed HTTP Traffic”, Israeli Networking Day, Cisco, Israel, 2009.
- ”A Parallel Error Detection Scheme for TCAM Devices”, Tel-Aviv University, CS colloquium, Israel, 2012.
- ”Deep Packet Inspection for Compressed Traffic”, Technion, Haifa, Israel, 2014
- ”Deep Packet Inspection for Compressed Traffic”, ETH, Zurich, Switzerland, 2014
- ”Opportunities in Middlebox Virtualization” , Keynote Speech at SYSTOR, Haifa, Israel, 2015.
- ”Deep Packet Inspection of Next Generation Network Devices”, iCore, Tel-Aviv, Israel, 2015.
- ”Advances in Deep Packet Inspection for Next Generation Network Devices”, Sigcomm Symposium on European Research in Computer Networking, Budapest, Hungry 2018

7 Graduate Students and Post-Docs

7.1 PhD student alumni:

- Udi Ben-Poret, ETH Zurich, co-advisor with Prof. Levy and Prof. Plattner, 2009 - 2014
  Current Position: Security Architect SIX group.
- Yaron Koral, Tel-Aviv University, co-advisor with Prof. Yehuda Afek, 2010 - 2013
  Current Position: Lead Inventive Scientist at AT&T, After post-doc at Princeton University with Prof. Jennifer Rexford.
- Yotam Harcol, Hebrew University , co-advisor with Prof. David Hay 2010 -2016
  Hans Wiener Prize for excellent Ph.D. dissertation, the Hebrew University.
  Current Position: a research scientist at DFINITY, after postdoctoral scholar at UC Berkeley, working at the NetSys group with Prof. Scott Shenker, and a research scientist at the EPFL.

- Liron Schiff, Tel-Aviv University, co-advisor with Prof. Yehuda Afek, 2011-2015
  Current Position: Chief Scientist at GuardiCore.

- Shir Landau Feibish, Tel-Aviv University, advisor Prof. Yehuda Afek with collaboration of Prof. Anat Bremler-Barr, 2011-2016
  Current Position: Senior Lecturer (Assistant Professor), Open University of Israel, after post-doc at Princeton University with Prof. Jennifer Rexford.

7.2 Post-Doc alumni:

- Shimrit Tzur , IDC 2011 - 2014

7.3 Master student alumni:

- Omer Ben-Shalom : TAU, co-adviser with Prof. Yehuda Afek, (2002 - 2003)
- Shemer Schwarts: TAU, co-adviser with Prof. Yehuda Afek, (2003 - 2005)
- Yaron Rosenbaum : IDC, co-adviser with Prof. Yishay Mansour, (2004 - 2006)
- Nir Halacmi : IDC, co-adviser with Prof. Hanoch Levy, (2004 - 2006)
- Omer Dekel : IDC, (2007 - 2008)
- Ronit Halachmi : IDC, (2007 - 2008)
- Farber Boris : IDC, (2006 - 2008)
- Nir Chen: IDC (2006 - 2008),
- Udi Ben-Porat: Tel-Aviv University Co-advisor with Prof. Hanoch Levy, (2008 - 2009)
- Yaron Koral: M.Sc, IDC (2008 - 2009)
- Ran Goldschmit : M.Sc, Haifa University, (2007 - 2009)
- Victor Zigdon: IDC, (2010 - 2011)
- Omer Kochba : IDC, (2014- 2015)
- Alon Atary : IDC, (2015- 2016)
- Mor Sides : IDC, (2015- 2016)
- Daniel Krauthgamer : IDC, (2015- 2016)
- Idan Moyal : IDC, (2016- 2017)

- Lior Shafir: TAU, (co-advisor with Prof. Yehuda Afek, 2016-2017)
- Haim Levy: IDC, (co-advisor with Prof. Zohar Yakhini, 2018-2020)
- Alon Noy : TAU, (co-advisor with Prof. Yehuda Afek, 2019-2020)
- Ben Ben-David : IDC, (2019- 2021)
- Avraham Shalev, IDC, (2018- 2021)
- Matan Sabag, IDC, (2019-2022)
- Dor Israeli, TAU, (co-advisor with Prof. Yehuda Afek),(2020-2022)
- Ran Shister, IDC, (2020-2022)
- Elad Wasserstein, IDC (co-advisor with Dr. Eli Brosh), (2019-2022)
- Master student: Daniel Bachar,IDC, 2020-2023
- Master student: Daniel Dubnikov, TAU (co-advisor with Prof. Yehuda Afek),2020-2023
- Master student: Shani Ben Atia, IDC, 2020-2023
- Master student: Michael Czeizler,IDC 2020-2022
- Master student: Neta Peleg, IDC, 2020-2023
- Master student: Shoham Danino, IDC, 2020-2024
- Master student: Daniel Alfasi, IDC, 2021-2024

7.4 Current Students

- Post-doc, Dr. Tal Schpira, IDC & HUJI, 2022-2024
- PhD student, Bar Meyuhas, IDC, 2020-
- Master student: Niv Focus, IDC, 2021-
- Master student: Yarra Shirki, TAU, 2023-
- Master student: Dan-Dick, TAU, 2024-
- Master student: Nave Tal, TAU, 2024-
- Master student: Vered Schiber, 2023-

8 Awards and Honors

- My students received the following awards on research under my supervision:
  - Lior Shafir, third place SIGCOMM research students competition, 2019
  - Yotam Harchol, Hans Wiener Prize for excellent Ph.D. dissertation, Hebrew University, 2016
  - Alon Atary, best in session, INFOCOM 2016
  - Shir Landau-Feibish, Broadcom Foundation University Research Competition Second Place, 2014
- Excellent Researcher IDC (2007,2013)
- Runner-up for the best INFOCOM paper award (2009) - One of the best 3 papers in the conference, out of 282 accepted papers and 1435 total submissions.
- Ph.D awarded with distinction, Tel-Aviv University,2002
- Eshkol fellowship for Ph.D. (2000)
- Excellence prize for Ph.D. research, Tel Aviv University (1999)
- An Intel Fellowship for distinguished graduate students, Tel-Aviv University (1998)
- A Wolf Fellowship for M.Sc. (1996)
- Annual Dean's list mentioning, faculty of Exact Sciences, Tel Aviv University, for every year of study for the B.Sc. and M.Sc (1991-1996)

9 Grants

- Consortium, " Encrypted Networks Traffic Monitoring (ENTM)", the Office of the Chief Scientist of the Ministry of Industry, 300K NIS a year, PIs: Prof. Anat Bremler-Barr with Prof. David Hay (equal shares) 2021-2024
- RedHat grant, Multi-cloud service Selection, 200K NIS, PI: Prof. Anat Bremler-Barr,2021-2022
- Cisco Research grant, MUD-based IoT Security in SD-WAN, 100K$
  PIs: Prof. Yehuda Afek, Prof. Anat Bremler-Barr and Prof. David Hay (equal shares), 2021
- Blavatnik Interdisciplinary Cyber Research Center, Tel Aviv University, "Attack Resilient and Efficient DNS infrastructure", 2019-2021, 124,000$, PIs: Prof. Yehuda Afek and Prof. Anat Bremler-Barr (equal shares)

- Neptune consortium, " Quality of experience in NFV and SDN environment", the Office of the Chief Scientist of the Ministry of Industry, 300K NIS a year, PIs: Prof. Yehuda Afek , Prof. Anat Bremler-Barr and Prof. David Hay, (equal shares) 2014-2018.

- Kabrnit consortium, "Algorithms for automatically defining and finding signatures for news attacks," the Office of the Chief Scientist of the Ministry of Industry, 300K NIS a year, Prof. Yehuda Afek and Prof. Anat Bremler-Barr (equal shares) 2012-2014.

- **ERC starting grant," Deep Packet Inspection of Next Generation Network Devices," 990,400 Euro**, Grant agreement no 259085, 2010-2016, funded Deepness-lab, PI: Prof. Anat Bremler-Barr

- Checkpoint research grant, "Deep Packet Inspection (DPI) with a Small Memory Footprint", 50K NIS,2009, PI: Prof. Anat Bremler-Barr

- SNF (Swiss) Grant, "The Vulnerability of Networks and Computers to DDoS Attacks: Quantifications, Evaluation and Solutions,", PIs: B. Plattner , H. Levy and Prof. Anat Bremler-Barr, 2009-2011, 142,725 CHF (used to fund the research of a student at Switzerland).

- Cisco Research Grant, 2007, 75,000$ "Fault-Resilient TCAMs", PIs: Prof. Anat Bremler-BArr and Prof. Danny Hendler , Prof. Ronny Roth (equal shares).

- REMON 4G Wireless consortium, "Resilience of Scheduling Algorithm", the Office of the Chief Scientist of the Ministry of Industry, Trade and Labor, Magnet 1.5.2007-30.4.2009, 180K NIS a year, PIs: Prof. Hanoch Levy and Prof. Anat Bremler-Barr (equal shares).

- Young G.I.F 32,500 Euro, "The cost of securing BGP, the Internet Routing protocol",2005 , PI: Prof. Anat Bremler-Barr

10 Teaching

- Computer Communications, TAU, 2024

- Operating systems, IDC, 2007-2022

- Workshop: Network Security, IDC, 2007,2008

- Workshop: Advanced Topics in IP Networks, IDC, 2013

- Workshop: Projects with the Industry and Academia, IDC, 2020-2021

- Workshop: Computer Networks, IDC, 2015

- Data Structure, IDC 2004-2007

- Advanced topics in IP Networks, IDC, 2004,2005,2007,2009-2013,2015,2018,2021

- Seminar: Internet Attacks - On Worms and DDOS, IDC 2006,2007,2011
- Seminar: Network Algorithmics, IDC, 2012
- Seminar: Clouds and Networking, IDC, 2013
- Seminar: Network Virtualization, IDC, 2016
- Advanced topics in Computer Architecture, IDC, 2004,2006,2008
- Computer Structure, Tel-Aviv University,1998-2002.
- Operating Systems, Tel-Aviv University, 1998-2002.

11 List of Publications

11.1 Papers in Refereed Journals

[J1] Yehuda Afek, Anat Bremler-Barr, Shir Landau Feibish, " Zero-Day Signature Extraction for High Volume Attacks", IEEE/ACM Transactions on Networking, 27(2):691-706, April 2019

[J2] Yehuda Afek, Anat Bremler-Barr, Shir Landau Feibish, Liron Schiff, "Detecting Heavy Flows in the SDN Match and Action Model", Computer Networks, 136: 1-12 2018

[J3] Anat Bremler-Barr, Yotam Harchol, David Hay, Yacov Hel-Or, "Encoding Short Ranges in TCAM Without Expansion: Efficient Algorithm and Applications", IEEE/ACM Transactions on Networking,26(2): 835-850, April 2018

[J4] Yehuda Afek, Anat Bremler-Barr, Yotam Harchol, David Hay, and Yaron Koral. "Making DPI Engines Resilient to Algorithmic Complexity Attacks", IEEE/ACM Transactions on Networking. 24(6): 3262-3275, 2016

[J5] Yehuda Afek, Anat Bremler-Barr, Liron Schiff, "Recursive design of hardware priority queues.", Computer Networks 66: 52-67, 2014

[J6] Udi Ben-Porat, Anat Bremler-Barr, Hanoch Levy, "Computer and network Performance: Graduating from the Age of Innocence ". Computer Networks 66: 68-81, 2014

[J7] Anat Bremler-Barr, David Hay and Yaron Koral, "CompactDFA: Scalable Pattern Matching using Longest Prefix Match solution", IEEE/ACM Transactions on Networking, 22(2): 415-428 , 2014

[J8] Udi Ben-Porat, Anat Bremler-Barr, Hanoch Levy ,"On the Exploitation of CDF based Wireless Scheduling", Computer Networks, 57(10): 2193-2205, 2013.

[J9] Udi Ben-Porat, Anat Bremler-Barr, Hanoch Levy, "The Vulnerability of Network Mechanisms to Sophisticated DDOS attacks", IEEE Transactions on Computers, 62(5): 1031-1043, 2013.

[J10] Anat Bremler-Barr, David Hay, Danny Hendler, Boris Ferber, "'Layered Interval Codes for TCAM-based Classification", Computer Networks, special issue on Challenges in High-Performance Switching and Routing in the Future Internet, 56(13):3023-3039, 2012.

[J11] Anat Bremler-Barr, Danny Hendler "Space-Efficient TCAM-based Classification Using Gray Coding", IEEE Transactions on Computers, 61(1): 18-30, 2012.

[J12] Anat Bremler-Barr, Yaron Koral , "Accelerating Multi-patterns Matching on Compressed HTTP Traffic", IEEE Transactions on Networking, 20(3): 970-983, 2012.

[J13] Yehuda Afek, Anat Bremler-Barr, Yaron Koral, "Space-Efficient Processing of Multi-Connection Compressed Web Traffic", Computer Communication, 35(7): 810-819, 2012.

[J14] Anat Bremler-Barr, Danny Hay, David Hendler, Ronny Roth, "'PEDS: A Parallel Error Detection Scheme for TCAM Devices", IEEE Transactions on Networking, 18(5): 1665-1675, 2010.

[J15] Anat Bremler-Barr , Ossi Mokryn, Jussi Kangasharju, Nir Chen and Yuval Shavitt, "Bringing Order To BGP: Decreasing Convergence Message Complexity", Computer Networks, 53(12): 2241-2256, 2009. (Brief Announcements) PODC, 2007

[J16] Anat Bremler-Barr, Hanoch Levy and Nir Halachmi, "Protecting Bursty Applications Against Traffic Aggressiveness", Computer Networks, 51(13): 3864-3877, 2007.

[J17] Anat Bremler-Barr and Leah Epstein, "Path layout on tree networks: Bounds in different label switching models", Nord. J. Comput. 14(1-2): 109-125, 2007.

[J18] Yehuda Afek, Anat Bremler-Barr, and Shemer Schwarts, "Improved BGP Convergence via Ghost Flushing", IEEE Journal on Selected Areas in Communications, 22(10): 1933-1948, 2004.

[J19] Anat Bremler-Barr, Edith Cohen, Haim Kaplan, and Yishay Mansour, "Predicting and bypassing end-to-end Internet service degradations", IEEE Journal on Selected Areas in Communications,21(6): 961-978, 2003.

[J20] Yehuda Afek, Anat Bremler-Barr, Haim Kaplan, Edith Cohen, and Michael Merrit, "Restoration by Path Concatenation: Fast recovery of MPLS paths", Distributed Computing, 15 (4): 273-283, 2002.

[J21] Yehuda Afek and Anat Bremler-Barr and Sariel Har-Peled, "Routing with a clue", IEEE/ACM Transactions on Networking, 9: 693-705, 2001.

[J22] Yehuda Afek and Anat Bremler, "Self-Stabilizing Unidirectional Network Algorithms by Power Supply," Special Issue for Self-stabilizing, Chicago Journal of Theoretical Computer Science, Dec. 1998.

11.2 Papers in Refereed Conferences

[C1] Anat Bremler-Barr, Hanoch Levy, Michael Czeizler, Jhonatan Tavori, Exploiting Miscoordination of Microservices in Tandem for Effective DDoS Attacks , INFOCOM, 2024

[C2] Yehuda Afek, Anat Bremler-Barr, Shani Stajnrod NRDelegationAttack: Complexity DDoS attack on DNS Recursive Resolvers Usenix Security , 2023

[C3] Anat Bremler-Barr, David Hay, Daniel Bachar, Optimizing Service Selection and Load Balancing inMulti-Cluster Microservice Systems with MCOSS IFIP Networking, 2023

[C4] Anat Bremler-Barr, David Hay, Bar Meyuhas, Shoham Danino, Itâ€™s Not Where You Are, Itâ€™s Where You Are Registered: IoTLocation Impact on MUD, ACM/IRTF Applied Networking Research Workshop (ANRW), 2023

[C5] Yehuda Afek, Anat Bremler-Barr, Dor Israeli and Alon Noy, Localhost Detour from Public to Private Networks, The International Symposium on Cyber Security, Cryptology and Machine Learning (CSCML), 2023

[C6] Anat Bremler-Barr, Matan Sabag , " Preventing the Flood: Incentive-Based Collaborative Mitigation for DRDoS Attacks" , IFIP Networking 2022

[C7] Eli Brosh, Elad Wasserstein , Anat Bremler-Barr, "Dynamic-Deep: Tune ECG Task Performance and Optimize Compression in IoT Architectures" Manage IoT workshop, IEEE/IFIP Network Operations and Management Symposium (NOMS) 2022

[C8] Anat Bremler-Barr, Bar Meyhaus , Ran Shister , "One MUD to Rule them All", IEEE/IFIP Network Operations and Management Symposium (NOMS) 2022 (Short-paper)

[C9] Yehuda Afek, Anat Bremler-Barr, David Hay, Avraham Shalev , "MUDirect: Protecting P2P IoT Devices with MUD", IEEE ithings-2021

[C10] Ronen Ben David , Anat Bremler-Barr, "Kubernetes Autoscaling: YoYo Attack Vulnerability and Mitigation," CLOSER 2021

[C11] Yehuda Afek, Anat Bremler-Barr, David Hay, Ran Goldschmidt, Lior Shafir , Gafnit Abraham , Avraham Shalev , "NFV-based IoT Security for Home Networks using MUD," IEEE/IFIP Network Operations and Management Symposium (NOMS) 2020

[C12] Anat Bremler-Barr, Haim Levy , Zohar Yakhini, "IoT or NoT: Identifying IoT Devices in a Short Time Scale," IEEE/IFIP Network Operations and Management Symposium (NOMS) 2020

[C13] Yehuda Afek, Anat Bremler-Barr, Lior Shafir , "NXNSAttack: Recursive DNS Inefficiencies and Vulnerabilities," USENIX Security 2020

[C14] Shir Landau Feibish , Yehuda Afek, Anat Bremler-Barr, Edith Cohen, Michal Shagam : "Mitigating DNS random subdomain DDoS attacks by distinct heavy Hitters sketches," HotWeb 2017 preliminary version at arXiv.

[C15] Anat Bremler-Barr, David Hay, Idan Moyal , and Liron Schiff , "Load Balancing Memcached Traffic Using Software Defined Networking," IFIP Networking 2017

[C16] Anat Bremler-Barr, Eli Brosh, Mor Sides , "DDoS Attack on Cloud Auto-scaling Mechanisms," INFOCOM 2017 preliminary version at SIGCOMM poster session

[C17] Yehuda Afek, Anat Bremler-Barr, Lior Shafir , "Network Anti-Spoofing with SDN Data plane," INFOCOM 2017

[C18] Anat Bremler-Barr, Yotam Harchol, David Hay: "OpenBox: A Software-Defined Framework for Developing, Deploying, and Managing Network Functions," ACM SIGCOMM, August 2016, preliminary version ACM SIGCOMM HotMiddleboxes, August 2015

[C19] Anat Bremler-Barr, Yotam Harchol, David Hay, Yacov Hel-Or: "Encoding Short Ranges in TCAM Without Expansion: Efficient Algorithm and Applications," In ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), July 2016

[C20] Anat Bremler-Barr, David Hay, Daniel Krauthgamer , Shimrit Tzur-David : "Scalable URL Matching with Small Memory Footprint," IFIP Networking, 2016

[C21] Alon Atari , Anat Bremler-Barr, "Efficient Round-Trip Time Monitoring in OpenFlow Networks," INFOCOM, April 2016

[C22] Anat Bremler-Barr, Yotam Harchol, David Hay, Yacov Hel-Or, "Ultra-Fast Similarity Search Using Ternary Content Addressable Memory," ACM DaMoN, June 2015

[C23] Yehuda Afek, Anat Bremler-Barr, and Liron Schiff , "ORange: Multi-field openflow based range classifier," ACM/IEEE Symposium on Architectures for networking and communications systems, ANCS, May 2015

[C24] Michela Becchi, Anat Bremler-Barr, David Hay, Omer Kochba , and Yaron Koral : "Accelerating Regular Expression Matching Over Compressed HTTP" IEEE INFOCOM, 2015

[C25] Anat Bremler-Barr, Shimrit Tzur David , Yotam Harchol , and David Hay: "Leveraging Traffic Repetitions for High-Speed Deep Packet Inspection" IEEE INFOCOM, 2015

[C26] Anat Bremler-Barr, David Hay, Yotam Harchol , Yaron Koral, "DPI as a Service", CoNEXT 2014

[C27] Yehuda Afek, Anat Bremler-Barr and Shir Landau Feibish, "Automated Signature Extraction for High Volume Attacks," ACM/EEE Symposium on Architectures for networking and communications systems, ANCS 2013, **Shir won Broadcom Foundation University Research Competition Second Place**

[C28] Yehuda Afek, Anat Bremler-Barr and Liron Schiff, " Recursive Design of Hardware Priority Queues", SPAA 2013.

[C29] Yehuda Afek, Anat Bremler-Barr, David Hay,Yotam Harchol, Yaron Koral, "MCA2: Multi Core Architecture for Mitigating Complexity Attacks", ACM/EEE Symposium on Architectures for networking and communications systems, ANCS 2012.

[C30] U. Ben-Porat, Anat Bremler-Barr, Hanoch Levy and B. Plattner," On the Vulnerability of Hardware Hash Tables to Sophisticated Attacks, " IFIP Networking 2012.

[C31] Anat Bremler-Barr, S. Tzur-David, David Hay, Yaron Koral," Decompression-Free Inspection: DPI for Shared Dictionary Compression over HTTP", IEEE INFOCOM, pages 1987-1995, 2012

[C32] U. Ben-Porat, Anat Bremler-Barr, Hanoch Levy, "Network and Computer Performance in Malicious Environments: The Good, the Bad and the Ugly," NETGCoop 2011.

[C33] Anat Bremler-Barr, Yaron Koral and V. Zigdon, "Shift-Based Pattern Matching for Compressed Web Traffic," IEEE International Conference on High Performance Switching and Routing (HPSR), 2011.

[C34] Anat Bremler-Barr, Yotam Harchol and David Hay, "Space-time tradeoffs in Software-based Deep Packet Inspection," IEEE International Conference on High-Performance Switching and Routing (HPSR),2011

[C35] Anat Bremler-Barr, O. Dekel,R. Goldschmidt, Hanoch Levy, "Controlling P2P applications via Address Harvesting: the Skype story", HOT-P2P workshop, 2011.

[C36] Yehuda Afek, Anat Bremler-Barr, Yaron Koral, "Efficient Processing of Multi-Connection Compressed Web Traffic", IFIP Networking , 2011.

[C37] Anat Bremler-Barr, R. Goldschmidt, "On the stability of Skype Super Nodes", Traffic Monitoring and Analysis Workshop (TMA), 2011.

[C38] U. Ben-Porat, Anat Bremler-Barr, Hanoch Levy, B. Plattner, "On the Vulnerability of Proportional Fairness scheduler to retransmission attacks", IEEE INFOCOM, 2011

[C39] Anat Bremler-Barr, David Hay, and Yaron Koral, "CompactDFA: Generic State Machine Compression for Scalable Pattern Matching", IEEE INFOCOM,2010.

[C40] Anat Bremler-Barr, Yaron Koral, "Accelerating Multi-patterns Matching on Compressed HTTP Traffic", IEEE INFOCOM, 2009.

[C41] U. Ben-Porat, Anat Bremler-Barr, Hanoch Levy, "On the Exploitation of CDF based Wireless Scheduling" (mini-conference), IEEE INFOCOM, 2009.

[C42] Anat Bremler-Barr, David Hay, Danny Hendler, Ronny Roth, "PEDS: A Parallel Error Detection Scheme for TCAM Devices", IEEE INFOCOM,pages 1296-1304, 2009. **Best Paper Award Runner-up**

[C43] Anat Bremler-Barr, David Hay, Danny Hendler, Boris Ferber, "'Layered Interval Codes for TCAM-based Classification", INFOCOM April 2009. Earlier (poster) version appeared ACM SIGMETRICS, pages 2008.

[C44] U. Ben-Porat, Anat Bremler-Barr, Hanoch Levy, "Evaluating the Vulnerability of Network Mechanisms to Sophisticated DDOS attacks", IEEE INFOCOM (mini-conference), 2008.

[C45] Anat Bremler-Barr, Danny Hendler, "Space-efficient TCAM-based Packet Classification using Gray Code", IEEE INFOCOM, 2007.

[C46] Anat Bremler-Barr, R. Halacmi-Bekel and J. Kangasharju, "Unregister Attacks SIP", NPSec Workshop, 2006.

[C47] Anat Bremler-Barr and Hanoch Levy "Spoofing Prevention Method", IEEE INFOCOM,2005, preliminary version PODC 2004 (Brief Announcment).

[C48] A.Bremler-Barr and L. Epstein, "Path layout on tree networks: Tight bounds in different label switching model", SIROCCO, 2004.

[C49] Anat Bremler-Barr, Yehuda Afek, and Shemer Schwarts, "Improved BGP Convergence via Ghost Flushing", IEEE INFOCOM, 2003.

[C50] Yehuda Afek, Anat Bremler-Barr, Omer Ben-Shalom, "On the structure and application of BGP Policy Atoms", Internet Measurement Workshop, 2002.

[C51] Anat Bremler-Barr, Edith Cohen, Haim Kaplan, and Y. Mansour, "Predicting and Bypassing End-to-End Internet Service Degradations", Internet Measurement Workshop, 2002.

[C52] Anat Bremler-Barr, Yehuda Afek, Haim Kaplan, Edith Cohen, and Michel Merrit, "Restoration by Path Concatenation: Fast recovery of MPLS paths", PODC 2001, preliminary version SIGMETRIC 2001 (short abstract).

[C53] Yehuda Afek, Anat Bremler-Barr, "Trainet: A new label switching scheme", IEEE INFOCOM, 2000.

[C54] Anat Bremler-Barr, Yehuda Afek, Sariel Har-Peled, "Routing with a Clue", ACM SIGCOMM, 1999.

[C55] Yehuda Afek and Anat Bremler, "Self-Stabilizing Unidirectional Network Algorithms by Power Supply", SODA, 1997.

11.3 Brief Announcements: Posters and Demos (with Proceedings)

[B1] Anat Bremler-Barr, Bar Meyuhas, Ran Shister, "Demo: MUDIS :MUD Inspection System", IEEE/IFIP Network Operations and Management Symposium (NOMS) 2022

[B2] Yehuda Afek, Anat Bremler-Barr, Neta Peleg, "Measuring Open Resolvers Negative Caching", Internet Measurement Conference (IMC) 2021

[B3] Anat Bremler-Barr, Bar Meyuhas, Ran Shister, "IoT Location Impact on Network Behavior and MUD", Internet Measurement Conference (IMC) 2021

[B4] Yehuda Afek, Anat Bremler-Barr, David Hay, Lior Shafir, Ihab Zhaika, "Demo: NFV-based IoT Security at the ISP Level." Demo, IEEE/IFIP Network Operations and Management Symposium (NOMS) 2020

[B5] Lior Shafir, Yehuda Afek, Anat Bremler-Barr, Neta Peleg, Matan Sabag,"DNS Negative Caching in the Wild," short abstract, SIGCOMM 2019, **Lior won third place in the ACM SIGCOMM Student Research Competition**

[B6] Yehuda Afek, Anat Bremler-Barr, Shir Landau Feibish, Liron Schiff, "Sampling and Large Flow Detection in SDN " (poster session) SIGCOMM '15

[B7] Yehuda Afek, Anat Bremler-Barr, Liron Schiff "Cross-Entrance Consistent Range Classifier with OpenFlow (short abstract)", ONS 2014, HotSDN 2014

[B8] Anat Bremler-Barr, Hanoch Levy and N. Halachmi, "Aggressiveness Protective Fair Queueing for Bursty Applications", (short paper) IWQoS Workshop, 2006.

11.4 Patents

[P1] Barr, David Hay, Yaron Koral, Yotam Harchol, "Method and System for providing Deep Packet Inspection as a service", US Application No. 15/321,472 national phase of PCT/IL2015/050641, year 2015.

[P2] Yehuda Afek, Anat Bremler-Barr, Yaron Koral, "Efficient processing of compressed communication traffic", US Patent 8,909,813, year 2014.

[P3] A Bremler-Barr, Y. Koral, V. Zigdon, " Multi-pattern matching in compressed communication traffic" US Patent 8,458,354, year 2012

[P4] Anat Bremler-Barr, David Hay and Yaron Koral "State machine compression for scalable pattern matching", US Patent 8,504,510, year 2012.

[P5] A Bremler-Barr, H Levin, O Dekel, "Detecting and controlling peer-to-peer traffic", US Patent App. 12/739,738, year 2010

[P6] Anat Bremler-Barr, David Hay, Danny Hendler and Ron M. Roth. ”TCAM with Fast Error Detection”. U.S. Provisional Patent Application No. 61/130129, May 2008.

[P7] Anat Bremler-Barr, Keren Horvitz, Dan Touitou, Rafi Tzadikario, Yehuda Afek, ”Weighted fair queuing-based methods and apparatus for protecting against overload conditions on nodes of a distributed network”, United States Patent Application 20030076848, 2003.

[P8] Guy Pazi, Anat Bremler-Barr, Rami Rivlin, Dan Touitou,” Protecting against distributed denial of service attacks” (PCT/IL02/00714, 10/232,993) , United States Patent Application 20030076848, 2003.

[P9] Anat Bremler-Barr, Touitou Dan, Rafi Zadikario, Yehuda Afek, ”Protecting against malicious traffic” (PCT/IL02/00996), 2002.

[P10] Rafi Zadikario, Dan Touitou, Anat Bremler-Barr,” Protecting against and stopping the spread of malicious worm traffic on the Internet”, (60/445,605), 2003.

[P11] Anat Bremler-Barr, Dan Touitou, Rami Rivlin, ”Detecting and protecting against worm traffic on a network”, United States Patent Application 20030076848, 2005.

[P12] Anat Bremler-Bar, Hank Nussbacher, Roi Hermoni, ”Selective diversion and injection of communication traffic”, United States Patent Application 20030076848, 2006.

[P13] Y. Afek, A. Bremler-Barr, S. Har-Peled ”Method for fast IP-lookup - routing with a clue”, United States Patent Application 6876655, 2005.

[P14] Y. Afek, A. Bremler-Barr, S. Har-Peled, ”Method for Fast Multi-Dimensional Packet Classification”, United States Patent Application 6633860, 2003.