

Curriculum Vita: Anat Bremler – Barr

A. Personal Data

- Name: Anat Bremler-Barr
- Born: 1972 Israel
- Office: +972-9-9602708
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- E-Mail: bremler@idc.ac.il
- Marital status: Married+2.

B. Research Interests

- Networking: Network Algorithmics, Giga-bit routers, Routing, IP-lookup & Classification, Network Protocols, Measurement
- Network Security: Denial of Service (DDOS), worms
- Distributed Algorithms.

C. Education

- **2002 Ph.D (with distinction):**
Computer Science, Tel Aviv University, Israel
Thesis title: Algorithm for Efficient and Reliable Routing in the Internet.
The title was awarded with distinction
Research supervised by Prof. Yehuda Afek
- **1997 M.Sc (Summa Cum Laude):**
Computer Science, Tel Aviv University, Israel
Graduated with honors (Summa Cum Laude)
Average: 97
Thesis title: Self-Stabilizing Unidirectional Network Algorithms by Power Supply
Research supervised by Prof. Yehuda Afek
- **1994 B.Sc. (Magna Cum Laude):**
Mathematics and Computer Science, Tel Aviv University, Israel
Graduated with honors (Magna Cum Laude)
Average: 92
- **1999 LL.B:**
Law, Tel Aviv University, Israel
Average: 81

D. Academic & Industrial Experience:

2003 - Current: Interdisciplinary Center Herzliya, CS Faculty member
2007-current: Senior Lecturer
2003-2007: Lecturer

Summer 2005, 2006: Advisor at start up companies (Allot and Commtouch).

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 ISPs & MSPs that need to cope with extreme data overload conditions. In particular, Riverhead Networks solutions targeted Distributed Denial of Service attacks (DDoS) as well as "Flash Crowds". The company was acquired by CISCO in 2004.

- 2000: Summer Internship at AT&T Menlo Park under the supervision of Dr. Edith Cohen.
- 1992-2002: Tel-Aviv University Teaching Assistant
- 1998-1999: Tel-Aviv-Yafo college Teaching Assistant
- 1997-1998: RadView Programmer
Programmer in C++, Developing multi-threaded application for performance testing of web-server.

E. Publications:

I. Referred Conferences:

- Y. Afek and A. Bremler, “**Self-Stabilizing Unidirectional Network Algorithms by Power Supply**”, *In Proc 8-th ACM-SIAM Symposium on Discrete Algorithms*, 111-120, 1997.
- A. Bremler-Barr, Y. Afek and S. Har-Peled, “**Routing with a Clue**”, *In Proc. ACM SIGCOMM 99*, September 1999. Harvard USA.
- A. Bremler-Barr, Y. Afek “**Trainet: A new label switching scheme**”, *In INFOCOM*, pages 874-883, Israel, 2000.
- A. Bremler-Barr, Y. Afek, H. Kaplan, E. Cohen, and M. Merrit “**Restoration by Path Concatenation: Fast recovery of MPLS paths**”, *In Proc. ACM SIGMETRIC 2001 (short abstract) full paper In Proc. ACM PODC*, 2001.
- Y. Afek, A. Bremler-Barr, H. Nussbacher, D. Touitou “**diversion and Sieving Techniques to Defeat DDOS**”, *NANOG*, 2001.
- A. Bremler-Barr, E. Cohen, H. Kaplan, and Y. Mansour, “**On the predictability and by-passability of end to end delays**”, *Internet Measurement Workshop*, Marseille, 2002.
- Y. Afek, A. Bremler-Barr and O. Ben-Shalom, “**On the structure and application of BGP Policy Atoms**”, *Internet Measurement Workshop*, Marseille, 2002.
- Bremler-Barr, Y. Afek, and S. Schwartz, “**Improved BGP Convergence via Ghost Flushing**” *INFOCOM*, San-Francisco, 2003
- Y. Afek, R. Brooks, N. Fischbach, P. Quinn, A. Friedrich, M. Binderberger, A. Bremler-Barr, B. Elgar, R. Hermoni, “**MPLS-Based Synchronous Traffic Shunt**”, *NANOG*, 2003

- A. Bremler-Barr and L. Epstein, “ **Path layout on tree networks: Tight bounds in different label switching model**”, *SIROCCO*, Slovakia, 2004
- A. Bremler-Barr and H. Levy “**Spoofing Prevention Method**”, Brief Announcement *PODC* 2004, full paper *INFOCOM*, Miami, 2005
- A. Bremler-Barr, H. Levy and N. Halachmi “**Aggressiveness Protective Fair Queueing for Bursty Applications**” (*short paper*) *IWQoS*, Yale University, 2006
- A. Bremler-Barr, R. Halacmi-Bekel and J. Kangasharju “**Unregister Attacks in SIP**”, *NPSec*, Santa Barbara, 2006
- A. Bremler-Barr, D. Hendler “**Efficient TCAM-based Packet Classification using Gray Code**” *INFOCOM 2007*
- A. Bremler-Barr, O. Mokryn, J. Kangasharju, N. Chen and Y. Shavitt “**Bringing Order To BGP: Decreasing Convergence Message Complexity**” (brief announcements) *PODC 2007*
- U. Ben-Porat, A. Bremler-Barr, H. Levy, “**The Vulnerability of Network Mechanisms to Sophisticated DDOS attacks**” *INFOCOM* (mini conference) 2008
- A. Bremler-Barr, D. Hay, D. Hendler, B. Ferber, “**Layered Interval Codes for TCAM-based Classification**” (poster session) *SIGMETRICS 2008*, (*full paper*) accepted to *INFOCOM 2009*
- A. Bremler-Barr, D. Hay, D. Hendler, R. Roth, ‘**PEDS: A Parallel Error Detection Scheme for TCAM Devices**’, accepted to *INFOCOM 2009*
- U. Ben-Porat, A. Bremler-Barr, H. Levy “**On the Exploitation of CDF based Wireless Scheduling**” (mini conference), accepted to *INFOCOM*, 2009
- A. Bremler-Barr, and Y. Koral “**Accelerating Multi-patterns Matching on Compressed HTTP Traffic**” accepted to *INFOCOM*, 2009

In preparation

- A. Bremler-Barr, O. Dekel, R. Golschmidt, H. Levy “**Controlling P2P applications via Address Harvesting: the Skype story**”

II. Journals Papers:

- Y. Afek and A. Bremler, “**Self-Stabilizing Unidirectional Network Algorithms by Power Supply**”. In *Special Issue for Self-stabilizing, Chicago Journal of Theoretical Computer Science*, Dec. 1998
- Y. Afek and A. Bremler and S.Har-Peled, “**Routing with a clue**” *IEEE/ACM Transactions on Networking*, vol. 9 pp. 693-705. Dec. 2001.
- A. Bremler-Barr, Y.Afek, H.Kaplan, E. Cohen, and M. Merrit, “**Restoration by Path Concatenation: Fast recovery of MPLS paths**”, *Special Issue of Distributed Computing*, 2002.
- A. Bremler-Barr, E. Cohen, H. Kaplan, and Y. Mansour, “**On the predictability and by-passability of end to end delays**”, *IEEE Journal on Selected Areas in Communications* 2003
- A. Bremler-Barr, Y. Afek, and S. Schwarts, “**Improved BGP Convergence via Ghost Flushing**”, *IEEE Journal on Selected Areas in Communications*, 2004
- A. Bremler-Barr, H. Levy and N. Halachmi, “**Protecting Bursty Applications Against Traffic Aggressiveness**”, in *Computer Networks* 2007, Volume 51 , Issue 13 Pages 3864-3877, 2007
- A. Bremler-Barr and L. Epstein “**Path layout on tree networks: Bounds in different label switching models**”, *NJC* 2007
- A. Bremler-Barr , O. Mokryn, J. Kangasharju, N. Chen and Y. Shavitt “**Bringing Order To BGP: Decreasing Convergence Message Complexity**” accepted to *Computer Networks* 2009

Submitted (under review)

- A.Bremler, D. Hendler “**Space-Efficient TCAM-based Classification Using Gray Coding**” submitted to *Transactions on Computers* 2009

In preparation:

- A. Bremler-Barr, H. Levy “**A Deployment-Attractive Spoofing Prevention Method**” will be submitted to *Computer Networks* 2009
- A. Bremler-Barr, D. Hay, D. Hendler, B. Ferber, “**Layered Interval Codes for TCAM-based Classification**” will be submitted to *MICRO* 2009
- A. Bremler-Barr, D. Hay, D. Hendler, R. Roth, “**PEDS: A Parallel Error Detection Scheme for TCAM Devices**” will be submitted to *MICRO* 2009
- U. Ben-Porat, A. Bremler-Barr, H. Levy, “**The Vulnerability of Network Mechanisms to Sophisticated DDOS attacks**”

III. Technical Reports

- Y. Afek and A. Bremler-Barr and S. Schwartz “**Explicit Edge Withdrawal in BGP**” (Shemer Schwartz, thesis manuscript) 2003
- A. Bremler-Barr, Y. Mansour, and Y. Rosenbum, “**Towards automatic root cause analysis of connection degradation**” (Y. Rosenbum, thesis manuscript) 2005.

F. Patents:

Ph.D:

- Y. Afek, A. Bremler-Barr, S. Har-Peled “**Method for fast IP-lookup - routing with a clue**”, United States Patent Application 6876655, 2005
- Y. Afek, A. Bremler-Barr, S. Har-Peled, “**Method for Fast Multi-Dimensional Packet Classification**”, United States Patent Application 6,633,860, 2003

Riverhead Networks:

- Yehuda Afek, Anat Bremler-Barr, Dan Touitou, **Methods and apparatus for protecting against overload conditions on nodes of a distributed network**, United States Patent Application 20020083175, 2002 .
- 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.
- 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.
- Anat Bremler-Barr, Touitou Dan, Rafi Zadikario, Yehuda Afek, **Protecting against malicious traffic** (PCT/IL02/00996) submitted 2002.
- Rafi Zadikario, Dan Touitou, Anat Bremler-Barr, **Protecting against and stopping the spread of malicious worm traffic on the Internet**, (60/445,605) submitted 2003
- Anat Bremler-Barr, Dan Touitou, Rami Rivlin, **Detecting and protecting against worm traffic on a network**, United States Patent Application 20030076848, 2005
- Anat Bremler-Bar, Hank Nussbacher, Roi Hermoni, **Selective diversion and injection of communication traffic**, United States Patent Application 20030076848, 2006.

IDC:

- Anat Bremler-Barr, David Hay, Danny Hendler and Ron M. Roth. “**TCAM with Fast Error Detection**”. U.S. Provisional Patent Application No. 61/130,129. May 2008
- A. Bremler-Barr, and Y. Koral "**Accelerating Multi-patterns Matching on Compressed HTTP Traffic**" Provisional Patent **2009**
- A. Bremler-Barr, O. Dekel, H. Levy, "**Detecting and controlling peer-to-peer traffic**", PCT **2008**

G. Grants:

- Young G.I.F 2005, 32,5000 Euro. “ The cost of securing BGP, the Internet routing protocol”
- REMON 4G Wireless consortium, Magnet 2007-2008, 180K NIS a year
- Cisco Research Grant, 2007, 75,000\$ “Fault-Resilient TCAMs" with Danny Hendler and Ronny Roth
- SNF (Swiss) Grant, "The Vulnerability of Networks and Computers to DDoS Attacks: Quantifications, Evaluation and Solutions" with B. Plattner, H. Levy, A. Bremler-Barr, 2009-2011, 142,725 CHF

H. Conference Program Committee:

- Security and Privacy in Information Society Conference, 2005
- Israeli Networking Day 2007
- INFOCOM 2008,2009
- PODC 2008

I. Honors & Awards:

- Excellent Researcher IDC (2007)
- 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)

J. Graduate Students (supervision of master thesis):

Former Students:

- Omer Ben-Shalom – Tel-Aviv University. Co-adviser with Prof. Yehuda Afek (graduation year - 2003)
- Shemer Schwarts – Tel-Aviv University. Co-adviser with Prof. Yehuda Afek (graduation year - 2005)
- Yaron Rosenbaum, IDC. Co-adviser with Prof. Yishay Mansour, Tel-Aviv University (graduation year - 2006)
- Nir Halacmi, IDC. Co-adviser with Prof. Hanoch Levy, Tel-Aviv University (graduation year - 2006)
- Ronit Halachmi, IDC (graduation year - 2007)
- Omer Dekel, IDC (graduation year - 2008)
- Farber Boris, IDC (graduation year - 2008)
- Nir Chen, IDC (graduation year - 2008)

Current Students:

- Udi Ben- Poret, TAU
- Yaron Koral, IDC
- Ran Goldschmit, Haifa University

K. Teaching Experience

- Lecturer at the following courses:
 - *Operating system* at IDC 2007,2008,2009
 - *Workshop: Network Security* at IDC 2007,2008
 - *Data Structure* at IDC 2004-2007
 - *Advance topics in IP Networks* at IDC 2004,2005,2007
 - *Seminar: Internet Attacks - On worms and DDOS* at IDC 2006,2007
 - *Advance topics in Computer Architecture* at IDC 2004,2006,2008
 - *Computer structure* course at Tel-Aviv University,1998-2002.
 - *Operating system* course at Tel-Aviv University, 1998-2002, MTA (Tel-Aviv-Yafo college) 1998-1999.
 - *Seminar: Advance topics in IP network* at Tel-Aviv University, 1999-2002
 - *Distributed Algorithm* in MTA (Tel-Aviv-Yafo college) 1999.
 - *Introduction to System Programming* - at Tel-Aviv University, 1995-1998.
- Teaching assistant: 1996-1999.
- Computer Lab Advisor at Tel-Aviv University, 1993-1994.