

Yaakov (Jonathan) Stein

Positions (non-academic)

2011-present: **CTO**, [RAD Data Communications](#), Tel Aviv, Israel
Responsible for analysis of future technologies, core technology development and demos, IPR issues (portfolio and defense), standardization efforts, and [training courses](#)

2016- present: **Chairman of the Board**, [the Neptune Consortium](#)

2014-2016: **cofounder, Neptune** - the Israel Consortium for Network Programming
Cofounder – from mid 2013 worked on defining scope and obtaining funding for consortium consisting of 10 corporations and 8 academic institutions researching SDN and NFV approaches to service provider networks
Board member – signatory responsibilities, represent RAD on board
technical committee chair – interface between academic research and working groups until 2015: **NFV WG chair** – coordinate all Network Functions Virtualization research

2000-2016: **Active participant**, [IETF](#)
Authored dozens of drafts, co-author of 6 RFCs and contributor to 15 RFCs
Major contributor to [PWE3](#) Working Group
Working Group Chair of [TICTOC](#) Working Group (2008-2016)
Member of the [Performance Metrics Directorate](#)

1999-2011: **Chief Scientist, and Head of Advanced Technologies Department**,
[RAD Data Communications](#), Tel Aviv, Israel

Chief Scientist:	Responsible for tracking relevant scientific trends Evaluation of new technologies Formalization of communications protocols Participation in standards committees (ITU-T, IETF, MEF, etc.) IPR – drafting patents, evaluating patents and Open Source Training courses and international conferences
Algorithm Research:	Digital Signal Processing (speech, fax, modem, telephony) Timing recovery over packet networks Packet application classification Service performance estimation and enhancement Telecommunications security algorithms
Innovations:	Responsible for technological innovations in company Fast prototyping

1995-1998: **Advanced Technology Manager**

1997-1998: **Digital Signal Processing Manager, Comverse Information Systems**
(Now [Verint Systems](#)) Woodbury, New York
Responsible for the development of advanced modem intercept and speech processing DSP for law enforcement and call center applications
Developed web-based highly compressed multimedia archive server

1998: **Scientific consultant**, [Symbol Technologies](#), Holtsville, NY
Developed prototype neural network for classification of bar-code images.

1989-1995: **Neural Network Applications Team-Leader, Efrat Future Technology Ltd.**

(Afterwards [Comverse Technology](#)) Tel Aviv, Israel

Developed state-of-the-art *OCR* (Optical Character Recognition) and *ASR* (Automatic Speech Recognition) applications based on neural network and artificial intelligence technologies

1986-1995: **Consultant to the Israel Ministry of Defense**

Advised in the fields of digital signal processing, pattern recognition and applications of artificial neural networks

Received (in 1991) *Israel Defense Award* (**פרס בטחון ישראל**) Israel's highest award for defense-related research

1980-1985: **Officer in the 8200 unit of the Israel Defense Forces** (rank: Major)

Research scientist specializing in the exploitation of artificial intelligence techniques in digital signal processing for communications, radar, and command and control systems

Participated in a large number of projects that were operationally deployed

see also [LinkedIn profile](#)

Academic

Author of textbook: *Digital Signal Processing: A Computer Science Perspective*

Published by John Wiley and Sons, August 2000

<http://www.dspscsp.com/> <http://www.amazon.com/exec/obidos/ASIN/0471295469>

2008-now: **Member of editorial board, [International Journal of Network Management](#)**

1999-now: **Adjunct, Computer Science Department, [Tel Aviv University](#)**

Responsible for the following courses:

- [0368.3464: Digital Signal Processing Algorithms and Applications](#) (1st degree)
- [0510.6402: Fundamentals of Communications Networks](#) (2nd degree)
- [0368.4136: Digital Signal Processing for Computer Science Students](#) (2nd degree)
- [0368.4338: Advanced Seminar in DSP](#)

2002-2011: **Adjunct Professor of Computer Engineering, [Jerusalem College of Engineering](#)**

Responsible for the following course:

- [10049: Digital Signal Processing for Software Engineering students](#)

1995-1998: **Adjunct Professor of Computer Science, [Polytechnic University](#),**

Farmingdale, New York.

Responsible for the following courses:

- [CS392: DSP for Computer Science students](#)
- [CS661: Artificial Intelligence](#)
- [CS662: Advanced AI](#)
- [CS667: Neural Networks](#)

Developed AI and NN specialties for MSc. students

Lectured to industry on uses of AI and neural networks

1986-1989: **PhD. in theoretical physics -- [Hebrew University of Jerusalem](#)**

Thesis: *Capacity of Neural Network Models*

1978-1979: **MSc. in theoretical physics - Hebrew University of Jerusalem**

Thesis: *Critical Temperature for Superconductivity in the Transition metals*

1974-1977: **BSc. in physics, math and computer science - Hebrew University of Jerusalem**

see also [ResearchGate profile](#)

Talks and Conferences

- 2018: **Keynote speaker:** [Israel DevCon](#) (Tel Aviv) [Abstraction in the Physical World]
- 2018: **Invited speaker:** [MPLS+SDN+NFV World 2018](#) (Paris) [ABCDE: the NFV Alphabet], and **panelist** [[SDN/NFV Hype or Reality](#), Blockchain]
- 2017: **Speaker:** [MEF17](#) (Orlando) [[QoS for Rich Communications Services](#)]
- 2017: **Invited speaker:** [MPLS+SDN+NFV World 2017](#) (Paris) [Virtual CPE Reality]
- 2016: **Invited speaker:** [MPLS+SDN+NFV World 2016](#) (Paris) [[EvolviNG CPE](#)]
- 2015: **Invited tutorial:** [IETF-93 \(Prague\)](#) [[SDN and NFV](#)]
- 2015: **Speaker:** [UTC Telecom & Technologies 2015](#) (Atlanta) [Migration to Packet Networks]
- 2015: **Speaker:** [Open Tech Israel SDN Symposium](#) (Tel Aviv) [SDN and NFV: The Five Trends]
- 2015: **Invited speaker:** [MPLS and SDN World Conference 2015](#) (Paris) [Lifecycle Assurance with vCPE]
- 2014: **Invited speaker:** [MPLS and SDN World Conference 2014](#) (Paris) [*D-NFV*], and **panelist** [Virtualization]
- 2013: **Invited speaker:** [MPLS and Ethernet World Conference 2013](#) (Paris) [QoSDN], and **panelist** [SDN]
- 2012: **Invited speaker:** [MPLS and Ethernet World Conference 2012](#) (Paris) [Comparing Access Packet-based Technologies [Part1](#), [Part2](#)] and panelist [MPLS End-to-End]
- 2011: **Invited speaker:** [MPLS and Ethernet World Conference 2011](#) (Paris) [OAM: Application Driven Evolution]
- 2010: **Invited Speaker:** [Ethernet Wholesale Summit](#) (Paris) [Timing over Packet Networks]
- 2008: **Speaker:** [TI Worldwide Developer Conference](#) [Cellular Backhaul Optimization]
- 2007: **Speaker:** [ITSF-2007](#) [Delivering Better Time-of-Day Using Synchronous Ethernet and 1588]
- 2004: **Invited speaker:** Communications Design Conference (San Francisco)
<http://www.commdesignconference.com/archive/papers/2004/P826.htm>
- 2001: **Chair and speaker:** Seminar on Access Networks (Kfar HaMaccabiah, Tel Aviv)
- 2001: **Invited speaker:** R&D-2001 [mark-up languages] (Tel Aviv)
- 2000: **xDSL track chair and 1/2-day tutorial:** [DesignCon2000](#) (Santa Clara, California)
- 2000: **Invited speaker:** DSP-2000 [xDSL] (Tel Aviv)
- 2000: **Speaker:** Telecommunications-2000 (Tel Aviv) [Perceptual Speech Quality]
- 1995: **Invited speaker:** 18th Convention IEEE Israel [Advances in Speech Recognition]
- 1994: **OCR session chair** at the [12th International Conference on Pattern Recognition](#)
- 1993: **Co-chair and organizer** of the [10th annual Israel AICVNN conference](#) ([proceedings](#))

Standardization Efforts

Co-chair of [IETF TICTOC](#) Working Group

Regularly participated in [IETF](#) and [ITU-T](#) meetings

Occasionally participated in [MEF](#), [ETSI](#), [ANSI](#), IP/MPLS (was MFA) Forum, DSL-forum

IETF: Coauthor of RFCs 4553, 5087, 5287, 5920, 6310, 7893, and numerous Internet Drafts

Contributed to RFCs 3916, 4197, 4385, 4733, 4734, 4901, 5244, 5611, 5885, and 6669

ITU-T Editor of Y.1413, Y.1418, Y.1452, Y.1453; major contributor to Y.1414, Y.1415, Y.1731

Selected Publications and Patents (see also <http://www.dspsp.com/pubs>)

Gabriel Zigelboim, Alon Geva, and Yaakov Stein (October 2017)

One-Way Packet Delay Measurement

[US Patent 9,787,461](#)

YJ. Stein, D. Black, B. Briscoe (June 2016)

PW Congestion Considerations

[RFC 7893](#)

Yaakov Stein, Ron Insler, and Alon Geva (June 2016, July 2018)

Triangle Loopback

US patents [9,369,362](#) and [10,021,006](#)

Alon Geva and Yaakov Stein (March 2016)

Pluggable Master Clock

[US Patent 9,276,689](#)

Yaakov Stein (07/2015)

SDN, NFV, and All That

[IETF Journal, Volume 11, Issue 1, pp. 11-14](#)

Alon Geva, Gabriel Zigelboim, and Yaakov Stein (March 2015, December 2016)

Timing over Packet Demarcation Entity

US patents [8,971,356](#) and [9,525,502](#)

Yaakov Stein et al. (July 2013)

Accessing Cloud Services

[draft-stein-cloud-access-03](#)

N. Sprecher et al. (July 2012)

An Overview of the OAM Toolset for MPLS-Based Transport Networks

[RFC 6669](#)

Alon Geva, Ehud Malik, and Yaakov Stein (November 2011)

High Quality Timing Distribution over DSL without NTR Support

US patents [8068430](#) and [8,660,150](#)

M. Aissaoui et al (April 2011)

Pseudowire (PW) OAM Message Mapping

[RFC 6310](#)

L. Fang et al. (July 2010)

Security Framework for MPLS and GMPLS Networks

[RFC 5920](#)

Yaakov Stein (April 2009)

The Value of Being Linked In

[Preprint](#)

A. Vainshtein and YJ. Stein (August 2008)

Control Protocol Extensions for the Setup of TDM Pseudowires in MPLS Networks

[RFC 5287](#)

Yaakov Stein (editor) (02/2008)
Pseudowire layer network
[ITU-T Recommendation Y.1418](#)

Yaakov (J) Stein (February 2008)
Cellular Backhaul Optimization: Cost effective approaches for Base Station Backhaul
[TI Worldwide Developer Conference \(Dallas, TX\) slides](#)

Y(J). Stein, R. Shashoua, R. Insler, and M. Anavi (December 2007)
Time Division Multiplexing over IP (TDMoIP)
[RFC 5087](#)

Yaakov (J) Stein, Alon Geva, and Gabriel Zigelboim (November 2007)
Delivering Better Time-of-Day Using Synchronous Ethernet and 1588
[ITSF-2007 \(London\) slides](#)

A. Vainshtein and YJ. Stein (June 2006)
Structure-Agnostic Time Division Multiplexing (TDM) over Packet (SAToP)
[RFC 4553](#)

Yaakov Stein (editor) (03/2006)
TDM-IP interworking - User plane interworking
[ITU-T Recommendation Y.1453](#)

Yaakov Stein (editor) (03/2006)
Voice trunking over IP networks
[ITU-T Recommendation Y.1452](#)

Yaakov Stein and Brian Stroehlein (2006)
Using Synchronization over PSN – Does IEEE 1588 Really Make a Difference?
NIST-ATIS Workshop on Synchronization in Telecommunication Systems ([WSTS '06](#))

Hugo Silberman, Tsvi Eitane, and Yaakov Stein (December 2004)
System and method for extending the range of xDSL services
[US Patent 6829246](#)

Yaakov Stein (editor) (03/2004)
TDM-MPLS network interworking - User plane interworking
[ITU-T Recommendation Y.1413](#)

Yaakov Stein (2004)
The Wonders of Digital Processing (in Hebrew)
[Galileo](#), vol 66, Feb 2004

Yaakov Stein and Eitan Schwartz (2001)
An Evolutionary Approach to Transporting Voice and Legacy Data over IP Networks
[Carriers world](#), 16/03/2001

Yaakov Stein (2001)
Extension of Telephone Services in an IP Network (in Chinese)
China Computer World, Nov. 5, 2001

Yaakov Stein and Eitan Schwartz (2000)
Ever thought about extending circuits over IP?
Telecommunications, Nov 2000 pp 89-94

Yaakov Stein and Eitan Schwartz (2000)
TDMoIP: An Evolutionary Approach to Transporting Voice over IP Networks (in Russian)
Networks and Communications Systems, Sept 2000 pp 96-101 <http://ccc.ru/magazine>

J. Y. Stein (2000)
Digital Signal Processing - a Computer Science Perspective
John Wiley and Sons, NY, ISBN 0471295469
<http://www.dspscsp.com> <http://www.amazon.com/exec/obidos/ASIN/0471295469/>

J. Y. Stein (2000)
TecForum - Tutorial on xDSL
DesignCon2000, Santa Clara, California
<http://www.designcon.com/2000/tecforum.html> - TFA6

Yaakov Stein (1994)
A Review of 'Minimum Classification Error' Training
[Efrat Future Technologies Technical Report](#)

Yaakov Stein (1994)
Neurons - Together they do Everything (in Hebrew)
[Computers Jan. 1994](#)

Y. Stein (1993)
False Alarm Reduction for ASR and OCR
[Proc. 10th IAICVNN](#), 195-200.

Y. Stein (1993)
Hyperplane Training of a Hypersphere Classifier
[Proc. 10th IAICVNN](#), 291-296.

R. Aloni-Lavi, Y. Metzger and Y. Stein (1992)
A BP Variant with Improved Convergence and Generalization
International Joint Conference on Neural Networks (Baltimore) I-932 - I-937
<https://www.amazon.com/exec/obidos/ASIN/0780305590/>

Y. Stein (Dec 1990)
Storage Capacity for Neural Network Models (in Hebrew)
PhD. Thesis, Hebrew University of Jerusalem - Theoretical Physics

H. Gutfreund and Y. Stein (1990)
Capacity of Neural Networks with Discrete Synaptic Couplings
[J. Phys. A \(Math. Gen.\) 23, 2613-2630.](#)

H. Gutfreund and Y. Stein (1989)
Neural Networks with Discrete Synaptic Couplings
[STATPHYS 17 \(Porto Alegre, Brazil\)](#)

H.J. Sommers, A. Crisanti, H. Sompolinsky and Y. Stein (1988)
Spectrum of Large Random Asymmetric Matrices
[Phys. Rev. Lett. 60, 1895-1898.](#)

Y. Stein (1983)
Two Dimensional Euclidean Regression
Conference on Computer Mapping (Herzlia, Israel) ([preprint](#))

Y. Stein (1981)
A Short Note Concerning Planiversal Solid State Physics
[First Symposium on Two-Dimensional Science and Technology](#) (ed. AK Dewdney) 90-91.

Y. Stein (1981)
Maxwell's Equations in Two Dimensions
[First Symposium on Two-Dimensional Science and Technology](#) (ed. AK Dewdney) 28-33.

Y. Stein (June 1979)
Critical Temperature for the Onset of Superconductivity in the Transition Metals (in Hebrew)
[MSc. Thesis](#), Hebrew University of Jerusalem - Theoretical Physics