

# Yaakov (Jonathan) Stein

## Positions

1999-now: **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](#)

Algorithm Research:       Timing recovery over packet networks  
                                  Packet application classification  
                                  Service performance estimation  
                                  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.**

(Now [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 *Israel Defense Award* (**פרס בטחון ישראל**) Israel's highest award for defense-  
related research

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

Research scientist specializing in the exploitation of artificial intelligence techniques in  
digital signal processing. Participated in a large number of projects that were operationally  
deployed.

## 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>

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

Responsible for the following course:

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

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

Responsible for the following courses:

- 0368.3464.01: [Digital Signal Processing Algorithms and Applications](#) (1<sup>st</sup> degree)
- 0368.4136.01: Digital Signal Processing for Computer Science Students (2<sup>nd</sup> degree)
- 0368.4338.01: Advanced Seminar in DSP

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**

## Talks and Conferences

- 2011: **Invited speaker:** [MPLS and Ethernet World Conference 2011](#) (Paris) [*OAM: Application Driven Evolution*]
- 2010: **Invited Speaker:** [Ethernet Whole Summit](#) (Paris) [*Timing over Packet Networks*]
- 2008-: **Co-chair** of [IETF TICTOC](#) Working Group
- 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, California)  
<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: **Invited speaker:** Telecommunications-2000 [*perceptual speech quality*] (Tel Aviv)
- 1995: **Invited speaker:** 18<sup>th</sup> Convention IEEE Israel [*Advances in Speech Recognition*]
- 1994: **OCR session chair** at the [12<sup>th</sup> International Conference on Pattern Recognition](#)
- 1993: **Co-chair and organizer** of the [10<sup>th</sup> annual Israel AICVNN conference](#)  
(Artificial Intelligence, Computer Vision, Neural Networks)

## Standardization Efforts

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

Co-chair of IETF TICTOC Working Group

Has participated in ETSI, IP/MPLS (was MFA) Forum, MEF, DSL-forum, T1E1 activities.

**IETF:** Coauthor of RFCs 4553, 5087, 5287, 5920, and numerous Internet Drafts.  
Contributed to RFCs 3916, 4197, 4385, 4733, 4734, 4901, 5244, 5611, and 5885.

**ITU-T** Editor of Y.1413, Y.1418, Y.1452, Y.1453; major contributor to Y.1414, Y.1415 and many other Recommendations

## Patents

US Application: *Timing-over-Packet Demarcation Entity*

US Application: *Optical Frequency Source*

**US 6,829,246** *System and Method for Extending the Range of XDSL Services*

US Application: *High Quality Timing Distribution over DSL without NTR Support*

US Application: *A Small Form-factor Device Implementing Protocol Conversion*

US Application: *Method for Low Bit Rate Compression of Combined Speech and Music*

US Application: *Asynchronous Audio Compression robust to packet network impairments*

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

M. Aissaoui et al (April 2011)

*Pseudowire (PW) OAM Message Mapping*  
[draft-ietf-pwe3-oam-msg-map](#)

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](#))

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 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](#)

Y. Stein (1993)  
*False Alarm Reduction for ASR and OCR*  
Proc. 10<sup>th</sup> IAICVNN, 195-200. <http://www.ibiblio.org>

Y. Stein (1993)  
*Hyperplane Training of a Hypersphere Classifier*  
Proc. 10<sup>th</sup> IAICVNN, 291-296. <http://www.ibiblio.org>

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  
<http://ieeexplore.ieee.org>

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