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Jeffrey Danowitz

Personal Information

- Date of Birth : 19.5.61
- Place of Birth : Baltimore, Maryland USA
- Address: Shivtei Israel 4/4
  Netanya
  Israel

Objective

I seek to work and lead in **Algorithmic Research and Development**, **and to implement these algorithms in an Industrial environment**. I enjoy both "hands-on" work and coaching/leading individuals and teams. I have developed and lead algorithms in Image and Signal processing, Computer Vision, Machine Learning, Deep Learning, CAD/CAM Computer Graphics, Computational Geometry, and in Robust Statistics. However I am also interested in, and have developed algorithms in other areas involving general Numerical Analysis. **I have experience with both Windows and Unix/Linux platforms, using C++, Python and MATLAB/Octave and Mathematica, and I have experience with Visual Studio and Eclipse.** My Ph.D. (and M.Sc.) research was in the field of Computational Fluid Dynamics (CFD) using Fortan77.

Professional Courses

2002 - COM, COM+, DCOM	**HiTech College**
2004. - Programming with the Microsoft .NET Framework (Microsoft Visual C# .NET)	**Sela Youniversity**
2005 - Programming on ARM	**Phoenix Technologies**
2005 - MFC	**Sela Youniversity**
2012 - Machine Learning	**Internal Course (Intel)**
2013 - C# and .NET	**Internal Course (Intel)**
2017 - Neural Networks (including Deep Learning)	**Coursera (Prof. Geoffrey Hinton)**
2018 - Deep Learning Specialization	**Coursera (Andrew Ng)**

Education

1994-5 Weizmann Institute of Science

Post Doctoral Research in Applied Mathematics

Worked under the supervision of Prof. Achi Brandt on Multigrid Techniques for PDEs.

1995. Tel Aviv University

Doctor Of Philosophy in Applied Mathematics

Worked under the supervision of Prof. Saul Abarbanel and Prof. Eli Turkel on "Non-Reflecting Boundary Conditions for 2-Dimensional Viscous Flows".

Lectured on this topic at the One – Day workshop on Numerics and PDEs 29.11.93, Tel Aviv University.

Invited to lecture at the Annual Meeting of the Israel Mathematical Union 21.4.94 Ben Gurion University.

1988. Tel Aviv University

Master of Science in Applied Mathematics

Worked Under the supervision of Prof. Saul Abarbanel in Computational Fluid Dynamics.

Paul Viderman Scholarship in 1988.

Scholarships from "Committee for the Aid of Foreign Students" 1985-6.

1983. Yeshiva University, New York

Bachelor of Arts in Mathematics

Graduated with honours (Magna Cum Laude).

Joseph Gunner Award for Mathematical Excellence.

Professional Experience

10/2018 – Present

Lead Algorithms Architect at TogaNetworks (Huawei)

The position began with ramping up a new project in terms of staff recruitment, academic and industrial relations, and building up the project computation infrastructure - all this while maintaining budget constraints. At the same time I built up the project scientific basis by on-boarding the team leaders and the team members as they joined the group. I served as the lead researcher for the group. Currently I still function as the IT lead for the group as well. The algorithms research involves developing novel methods for VPS (visual position services), or image based position localization. To that end, we are developing methods based on "classical computer vision" and methods based on on "deep learning" approaches. We work on Microsoft Windows and Ubuntu, developing mainly in and Python and C++ and using Matlab/Octave. The project involves performing localisation and position tracking using acquired images via computer vision, and IMUs. The goal is to provide a navigation experience even in situations where wifi and/or other external signals/clues are missing.
The project requires working and coordination with our team in China

11/2017 – 9/2018

Computer Vision Algorithms Expert at Dentlytec

Position deals with developing and implementing algorithms in 3D computer vision for the dental industry. Teeth are accurately reconstructed using a unique home built scanner along with in-house state of the art 3D computer vision algorithms.

7/2016 – 10/2017

Algorithms Expert at ShowBox (startup creating DIY movies in a web format)

Project deals with rendering DIY movies that involve multiple assets and "keying" (background removal) of "talents". I am currently working on state of the art keying (background removal/matting) algorithms to get a perfect key (segmentation). The project involves developing in-house algorithms using C++ on Ubuntu using the Eclipse IDE. Parts of the project also require Python. Parts of the algorithm involved Deep Learning. Additionally, Matlab is used in our research.

1/2011 – 7/2016

Intel Haifa - Computer vision and Image processing Algorithms Team Leader and Research Scientist

Project deals with perceptual computing, developing an ISP and computer-vision algorithms for 2D and 3D imaging. Worked on camera ISP blocks, 3D depth camera development, Facial Motion Capture (face detection, facial pose detection, facial feature point detection and tracking) - Machine Learning Algorithms. The ISP and computer vision algorithms are developed in-house in C++ using Visual C++ and with the aid of Matlab.

6/2008 – 12/2010

Algorithms Expert at Tessera dealing with Image correction in images acquired from a camera with specially developed lenses and using a CMOS sensor

This position involves developing algorithms for EDOF (Extended Depth of Focus) and Zoom and image stabilization and enhancement (**Denoising, Disparity Correction, Sharpening, Axial Chromatic Aberration correction**, among others) for images acquired. The development is in Matlab and in C++. I also developed a complete ISP simulation tool in Visual C++ which required implementation of **an entire camera ISP** from the Bayer "camera acquired" (or raw loaded) image to the visualized RGB image.

10/2006 – 5/2008

Image Processing Expert at Primesense: a Startup dealing with real-time 3D depth reconstruction

This position involves leading the research development and implementation of algorithms that reconstruct depth information, and use this depth information to build applications that require depth information. In addition, the position required developing and implementing "3D" registration techniques between 2 (or more) cameras. The work was carried out both using Matlab and Visual C++. Specifically, algorithms for **Background Removal**, and **Humanoid detection and modelling** were developed.

3/2005 – 10/2006

Image Processing/Algorithms Research Project Leader at Samsung Telecom Research Israel (STRI)

The position involves researching, developing and implementing Computer Vision, Image Processing and Numerical Algorithms on CDMA cellular telephones using BREW on an ARM processor. Specifically, efficient **Face Detection** and **Camera-Motion** algorithms were developed and implemented.
The position involves project management as well. The research ideas are carried out using Visual .Net (C++), Matlab and ADS (Arm Development Suite). Implementation and testing were performed both on an offline Development Tool and on the cellular device.

9/2002 – 3/2005

Team Leader in Image Processing – Applied Materials

Senior algorithm developer and Team Leader in Image Processing Project dealing with developing Measuring Instruments for the **Silicon Wafer Industry**. The position involves developing and implementing image-processing algorithms for SEM images taken for identifying and classifying defects in the silicon wafer process as well as improving the image quality of the SEM images taken. The position involves developing algorithms in Image Processing using (**Visual) C++ and in MATLAB**. The position involves working with IP cards developed by Matrox including Genesis and ODC.

8/1999 – 9/2002

Team Leader in Algorithms – Nova Measuring Instruments Ltd.
Senior algorithm developer and **Team Leader in Image Processing** Project dealing with developing Measuring Instruments for the Silicon Wafer Industry. The position involves developing, designing, and implementing advanced Image Processing algorithms for Overlay Metrology and Macro Wafer inspection in **(Visual) C++** and **MATLAB**. I also managed the Image Processing team in the product line. The position also involves developing MDI offline tools for algorithm development in MFC (including the MMI) to be used by system engineers. The project was multi-disciplinary and involved understanding of **real-time** programming and using **MIL** and **IPL** libraries.

9/1998 – 8/1999

Algorithms Department -- Orbotech Ltd.
Developed Algorithms in **C++ and Matlab for Image/Signal Processing using Robust statistics, Neural Networks and Radial Basis Functions**. Worked as part of a team developing a hardware product and integrating the software into it.

1/1996 -- 9/1998

Senior Researcher in Algorithms Development – Scanvec Ltd.
Developed and Implemented Algorithms in C++ for Computational Geometry, Computer Graphics, and CAD/CAM and researched, developed and solved general numerical problems.

1994 – 1995

Postdoctoral Research Fellow at the Weizmann Institute of Science, in Mathematics.

1985 -- 1994

Assistant, and Junior Faculty Member in the Mathematics Department at Tel Aviv University

Publication

"A Far-Field Non-Reflecting Boundary Condition for Two-Dimensional Wake Flows", ICASE Report 95-63. Co-authored with Saul Abarbanel and Eli Turkel.

Patents

Accepted:

"Method for determining the internal orientation of a wafer", United States Patent 6,544,805. Co-invented with Ido Holcman, and Alexander Shulman (April 8,2003).

"Facial Feature detection, method and device", United States Patent 7,860,280 (December 28, 2010 - single inventor).

"Modeling Of Humanoid Forms From Depth Maps", United States Patent 8,249,334. Co-invented with Tamir Berliner, Ziv Hendel, Alexander Shpunt, Dmitri Rais, Oren Mor, and Michael Shpigelmacher, (August 21, 2012)

"Continuous Edge and Detail Mapping Using a Weighted Monotony Measurement", United States Patent 8,687,894. Co-invented with Noy Cohen and Orly Liba (April 1, 2014)

"Anisotropic Demonising Method", United States Patent 8,879,841. Co-invented with Noy Cohen and Orly Liba (Novenber 4, 2014)

"Apparatus and techniques for image processing", United States Patent 9,036,047. Co-invented with Sarit Schwartz, Ziv Aviv and David Stanhill. (May 19, 2015)

"Structured Stereo", Publication Number: 20150310620, Published October 29, 2015. Co-invented with Ziv Aviv, David Stanhill, Dror Reif and Ehud Pertzov.

Submitted:

"RGB Registration" (Provisional Patent), Submitted to the US Patent Office in March, 2007.

"Human Head Detection from Depth Images" (Provisional Patent), Submitted to the US Patent Office in November, 2012.

"Nose Detection and Head Pose Detection from Depth Information" (Provisional Patent), Submitted to the US Patent Office in November, 2012.

References

References available upon request.

Hobbies

Since my youth, I have been involved in music - playing the piano and trumpet, composing, performing and going to concerts. I also enjoy playing tennis, do a lot of camping, hiking and bike riding. For the past two and a half years, I have become an avid climber doing top-rope, lead-climbing and bouldering.

Community Service

(1) Volunteered in the Traffic Police Department in the Tel Aviv Yarkon Police Division.
(2) Past-President of Conservative Synagogue in central Tel Aviv.
(3) Volunteer teaching in various programs, helping to advance high-school students in mathematics.
(4) Serve as a mentor for the Machine Learning course in Coursera.