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# BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.  
Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Peter Brandon Reintjes

eRA COMMONS USER NAME (credential, e.g., agency login): PReintjes

POSITION TITLE: Exhibits Engineer, North Carolina Museum of Life and Science

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)

| INSTITUTION AND LOCATION | DEGREE  (if applicable) | Completion Date  MM/YYYY | FIELD OF STUDY |
| --- | --- | --- | --- |
| University of North Carolina, Chapel Hill | B.S. | 1980 | Physics |
| Visiting Scientist, IBM T.J. Watson Research Center  (technically a post-doctoral position, but based upon my research and publications rather than an academic degree) |  | 1995 | Logic Programming |
|  |  |  |  |

NOTE: The Biographical Sketch may not exceed five pages. Follow the formats and instructions below.

# A. Personal Statement

I have been working for many years on the automation of complex, repetitive, laboratory processes using a variety of technologies including low-cost computational systems such as micro-controllers, single-board Linux-based computers, 3D printing technology, open-source scientific software tools including Python, OpenCV, and Prolog. By exploiting developments in low-cost computation and sensor technology, I can construct customized high-throughput platforms for research environments with orders-of-magnitude lower cost and as a flexible alternative to more expensive equipment which are not easily modified and integrated.

My career has been one of highly interdisciplinary work in research organizations, and I was simply too busy to get a PhD. My PhD would have been at the nexus of Electronics, Software Engineering, and Molecular Biology which is, happily, what I find myself doing today.

My first publication in electronic design dates from my sophomore year in college, and by the next year, I was employed by the UNC-CH computer science to build computer graphics devices for graduate research, specifically, protein crystallography visualization. After completing my physics degree, I developed micro-code for a new Data General computer and two years later was offered a research position at the Microelectronics Center of North Carolina. My work there eventually led to an invitation to be a Visiting Scientist at the IBM T. J. Watson Laboratory. Before this fellowship was completed, I accepted a staff position at IBM Research.

As instrumentation consultant for Innatrix, I find a perfect outlet for my experience in the design of electronic systems, software development in application, database, networking, and systems programming on UNIX/Linux and Windows platforms, as well as machine-shop experience fabricating devices from aluminum, stainless-steel, wood, and plastic, together with a life-long interest in and occasional opportunities to contribute to protein structure research.

# B. Positions and Honors

1977-1980 Graphics Laboratory Engineer, University of North Carolina, Computer Science Dept.

1980-1982 Microcode Programmer/Engineer, Data General Corporation

1982-1989 Member of Technical Staff, Microelectronics Center of North Carolina

1990-1993 Applications Engineer, Quintus Corporation

1993-1995 Visiting Scientist (then staff), IBM T. J. Watson Research Center

1995-1999 Principal Staff, NetSpeak Corporation

1999-2002 Principal Staff, Etchstone Corporation

2003-2006 Director, Free Electronics Laboratory, Durham North Carolina

2007 Contractor, GlaxoSmithKline Research

2007-Pres. Exhibits Engineer, North Carolina Museum of Life and Science (NCMLS)

2009-2015 Board of Directors/Vice President, The Scrap Exchange

2012 Statistician, GlaxoSmithKline (8-month leave from NCMLS)

2012-Pres Instrumentation Builder/Consultant, Innatrix

# C Contribution to Science

**3D Display for Protein Structure Modeling.**  Developed three different display systems for the simultaneous display of protein models and crystallography data for the GRIP project at UNC-CH between 1976 and 1980.

**CAD Software, IC Design, Bio Informatics.**  Member of the team developing the VIVID symbolic layout system for Very Large Scale Integrated circuit design at the Microelectronics Center of North Carolina and IBM Corporation. Developed two CMOS chip architectures for Biological Sequence Analysis with C. Thomas White (UNC Program in Molecular Biology). The first, CAP (Combinatorial Array Processor) was manufactured and tested at MCNC in 1985. The second, BIOSCAN was used for molecular biology research at UNC-Chapel Hill and the National Library of Medicine in Washington, DC.

**Internet Telephony.** Member of the Netspeak development team for one of the first internet telephone systems. Compression and encryption of low-latency audio and out-of-band data delivery systems. I was the team leader for the large-scale automated call handing and queuing system.

U.S. Patent #6,178,453 “Virtual circuit switching architecture for IP-telephony and collaborative computing applications”.

**Etchstone Slate.** Principal designer/developer of the hardware and software for a Linux-based mobile computing platform to capture handwriting and audio for web-based collaboration.

U.S. Patent #6,912,308 “Apparatus and method for automatic form recognition and pagination”.

U.S. Patent #6,618,040 “Apparatus and method for indexing into an electronic document to locate a page or a graphical image”.

**Protein interaction network visualization at GlaxoSmithKline.** Perl, C/C++, and database programming for search and visualization of large protein-protein interaction databases.

**Assay Development for GlaxoSmithKline** Python, C/C++, Matlab, and Perl programming for large-scale sequence analysis tasks related to nucleic assay development (Multiplex PCR/signaling) at GlaxoSmithKline. Scripts to automate usage of NCBI BLAST+, PrimerBLAST, and Primer3. Maintained a local BLAST database of all GenBank(NR) sequences, and built all open-source tools locally to allow for substantive modifications. Developed and automated a work-flow for in-silica nucleic assay development with Web-based monitoring.

**Exhibits Engineer at the Museum of Life and Science.** Design and maintenance of electronic systems for audio, video, and motion control including Windows, Linux, and microcontroller-based interactive exhibits. Design and machining of custom aluminum and stainless steel parts, 3D printing in ABS, PLA, and nylon, power circuits for AC, DC and stepper motor systems, lasers, mechanical and electronic design of chemical-handling robotic systems with high-level (Prolog/Constraint-logic programming) software control.

## Relevant Publications, Other Patents

U.S. Patent #5,728,963 for "Low-Power Music Synthesizer and Transmitter", technology for short-range radio-based toys and radio-location devices

Reintjes, P.B. Stretching Homologies to the Breaking Point, Banquet Speech, ICPAP/PACT, Paris, April 1995.

Reintjes, P.B. Rajgopal S. MULTI/PLEX: Tools for Formal Languages, Programming Environments Workshop*, International Conference and Symposium on Logic Programming*, Vancouver, November 1993.

Reintjes, P.B. Elegant Technologies, Invited Talk*,* ***International Conference on the Practical Applications of Prolog***, ALP, London, April 1992.

Reintjes P.B. A Set of Tools for VHDL Design\**,* ***International Conference on Logic Programming***, Paris, June 1991. MIT Press.

\*Also appears in ***Logic Programming in Action: Proceedings of the Second International Logic Programming Summer School***, Zurich, September 1992, Springer-Verlag.

White et al. BIOSCAN: A VLSI-Based System for Biosequence Analysis, ***1991 IEEE International Conference on Computer Design***, October 1991, IEEE Computer Society Press.

Reintjes, P.B. PREDITOR: A Prolog-based VLSI Editor, ***The Practice of Prolog***, Leon Sterling, Editor, pp.21-72, November 1990, MIT Press.

Reintjes, P.B. A VHDL Parser in Prolog, **MCNC Technical Report 90-41**, March 1990, Microelectronics Center of North Carolina.

Reintjes, P.B. AUNT: A Universal Netlist Translator, ***1987 Symposium on Logic Programming***, September 1987, IEEE Computer Society Press, also in ***Journal of Logic Programming***, 1990:8:5-19 North Holland.

Reintjes, P.B. AI Methodology as a Key for Software Re-usability, ***Tools for Artificial Intelligence*** *- TAI-89*, October 1989, IEEE Computer Society Press.

Reintjes, P.B. AI Languages and Software Engineering, ***AAAI Spring Symposium***, March 1989, Stanford University.

Reintjes, P.B. A VLSI Design Environment in Prolog, ***Logic Programming: The Proceedings of the Fifth International Conference and Symposium***, August 1988, MIT Press

Reintjes, P.B. Network Tools: Ideas for Intelligent Network Software, **Byte Magazine**, October 1981.

Reintjes, P.B. UNIX/C Seminars, 1980, Eatoin Corporation.

Reintjes, P.B. Phase-Locked Waveform Generator, ***Electronics***, February 1978, McGraw-Hill.

Reintjes, P.B. Self-gating Sample-and-Hold Controls Oscillator Frequency, ***Electronics***, June 1977.

# D. Research Support