Personal data sheet

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Born on 23rd of June 1975 in Göttingen.
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Professional activities

since 2019 **Software Developer**, LaVision BioTec GmbH, Göttingen
- Modern C++: Stitching of 3D mosaic microscope imaging stacks, Imaging I/O + Python Bindings
- Middleware Architecture Development (ZeroMQ)
- Virtualized Multi-OS CI Solution (using Buildbot, Ansible, Packer, Vagrant)

2018-2019 **Software Developer**, Max Planck Institute for Solar System Research, Göttingen
- PLATO Data-Center Database Development in Java with Bindings to C++ and Python
- Test/Simulation of Network Dataflows in WANs
- Evaluation of UI Libraries, Big Data solutions and Storage/Transfer Concepts

2013-2017 **Software Development and Administrator**, GWDG, Göttingen
- Development of an OpenStack Client (Java) and an E-Mail Signing-Gateway (Python, OpenBSD)
- Administration of DFN AAI Shibboleth Identity Providers (Uni Gö, Max-Plank and GWDG)
- Provisioning of a C++/R Build-Farm (buildbot) and an LDAP Server for OpenStack

2006-2012 **Research Assistant**, Chair of Statistics and Econometrics, University of Göttingen
- Development of R Packages: *rgl* (C++), *rdyncall* (C), *ff* (C++), *BayesXsrc* (C++), *vioplot*
- R Courses für Master/PhD Studenten
- Development of a CMS in PHP and Webmaster

2006-2007 **C++ Developer** (Freelancer), Sketch2, Toronto, Canada
- OSD 2D UI Toolkit Framework and 3D camera-flight algorithm

2003-2004 **Application Developer (Java Swing/Linux)**, B&N Software AG, Göttingen
- Transaction-Monitor and Workflow Designer for M@gicEddy AI EDIFACT Converter
- IDE for In-house programming-language "S2S"
- I/O Watchdog/Job Scheduler (C++/Win32)

1995-2001 **Freelancer (3D Rendering, C++, Web)**
- Text Layout Engine (C++) based on FreeType (VariaMedia GmbH, Hamburg)
- "*Euro Experts Chat*" (Perl CGI) (Bauhaus f. Kommunikation, Göttingen / DG Bank, Frankfurt)
- Online-Survey Tool (Perl) (Institute for Marketing and Commerce, Göttingen)
- Title Animation Computer-Game *Der Produzent, die Welt des Films* (Silverstyle Entertainmet, Berlin)

Education and studies

2005-2013 **Doctorate**, Chair of Statistics and Econometrics, University of Göttingen
Thesis: *"Dynamic Language Bindings for C Libraries with emphasis on their application to R"*

1996-2003 **Diploma**, Business Informatics (Wirtschaftsinformatik), University of Göttingen
Thesis: *"Interactive visualization of multi-dimensional data in R using OpenGL"*

Articles

E-Mail-Signierdienst
Adler, D. (2017), GWDG Nachrichten, Issue 07/17, pages 11-14

Single-Sign-On-Infrastruktur
Adler, D. (2016), GWDG Nachrichten, Issue 04/16, pages 12-15

Structured Additive Regression Models: An R Interface to BayesX
Umlauf N., Adler, D., Kneib, T., Lang, S., Zeileis, A. (2015), Journal of Statistical Software Vol 63, Issue 21

„Heartbleed" Bug - Der Super-GAU für OpenSSL und HTTPS
Adler, D. (2014), GWDG Nachrichten, Issue 06/14, pages 6-8

Foreign Library Interface
Adler, D. (2012), R Journal Vol 4/1, pages 30-40

Conference contributions

A Framework for an R to OpenGL Interface for 3D graphics
Adler, D., Nenadic, O. (2003), Draft in 3rd International Workshop on Distributed Statistical Computing, Vienna, Austria.

RGL: A R-library for 3D visualization with OpenGL
Nenadic, O., Adler, D., Zucchini, W. (2003), Refereed in 35th Interface: Computing Science and Statistics, Salt Lake City, USA.

Presentations

Generic Algorithms for n-Dimensional Indexing in C++
Adler, D. (2020), Software Development Workshop 2020-04-23, LaVision BioTec, Göttingen.

PDC System Simulation: Bulk Data Transfer - Benchmarks, Suggested Tools and Techniques
Adler, D. (2018), PLATO Meeting 2018-10-23, MPSSR, Göttingen.

dyncall and dynports: Dynamic bindings of shared libraries - multi-platform!
Adler, D. (2009), Lightning Talk, Chaos Communication Congress 2009, Berlin.

The "rdyncall" package: An Improved foreign function interface for R.
Adler, D., Philipp, T. (2009), R User Conference, Rennes, France.

Managing data.frames with package 'ff' and fast filtering with package 'bit'
Oelschlägel, J., Adler, D. (2009), R User Conference, Rennes, France.

Coordinating package "ff" for large objects with R base
Oelschlägel, J., Adler, D. (2009), Distributed Statistical Computing, Copenhagen, Denmark.

High-Performance Processing of Large Data Sets via Memory-Mapping: Case Study in R and C++
Adler, D., Oelschlägel, J., Nenadic, O., Zucchini, W. (2008), Joint Statistical Meetings, Denver, Colorado, USA.

Large atomic data in R: package "ff"
Adler, D., Oelschlägel, J. (2008), R User Conference, Dortmund.

A first glimpse into "R.ff"
Oelschlägel, J., Adler, D. (2008), R User Conference, Dortmund.

The "ff" package: Handling Large Data Sets in R with Memory Mapped Pages of Binary Flat Files
Adler, D., Nenadic, O. (2007), R User Conference, Ames, Iowa, USA.

On the Analysis of Large Data in R
Adler, D., Nenadic, O. (2007), Dia Espanol-Aleman de la Estadistica y Econometria, Göttingen.

"RGL" in 2007
Murdoch, D., Adler, D. (2007), R User Conference, Ames, Iowa, USA.

A Framework for an R to OpenGL Interface for 3D graphics
Adler, D., Nenadic, O. (2003), Distributed Statistical Computing, Vienna, Austria.

Interactive visualization of multi-dimensional data in R using OpenGL
Adler, D. (2002), Statistik Workshop, 2002, Göttingen.

Elate OS und der Virtual Processor
Adler, D. (2000), Informatik Workshop, 2000, Mathematisches Institut, Göttingen.

Poster sessions

WiSP package as a study design tool for abundance estimation
Rexstad, E., Borchers, D., Zucchini, W., Adler, D. (2008), International Statistical Ecology Conference, St. Andrews, Scottland.

R General Purpose Computing on Graphics Processing Units
Glaeser, C., Adler, D., Nenadic, O., Zucchini, W., Sperlich, S. (2007), R User Conference, Ames, Iowa, USA.

The ff package: Handling Large Data Sets in R with Memory-Mapped Pages of Binary Flat Files
Adler, D., Nendaic, O., Zucchini, W., Glaeser, C. (2007), R User Conference, Ames, Iowa, USA.

Computational Issues in Creating an Online Atlas
Nenadic, O., Zucchini, W., Adler, D., Kratz, G. (2004), Compstat 2004: 16th Symposium of the IASC, Prague, Czech.

Visualizing Three-Dimensional Maps in Correspondence Analysis
Nenadic, O., Adler, D., Zucchini, W. (2003), CARME 2003, Barcelona, Spain.

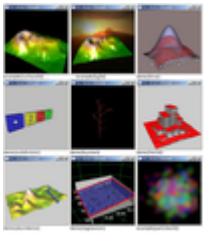
Interactive 3D-visualization in R
Nenadic, O., Adler, D. (2003), ISI, Berlin.

Open-Source Software Packages

`dyncall` (since 2007) Low-level middleware library with C API for implementation of foreign function interfaces (FFI)s for making calls dynamically at run-time to arbitrary natively compiled functions from within scripting interpreters, application servers and language middleware components. It is implemented in C and Assembly (small memory footprint ≈ 20kb binary) and comprises ports to various ABIs with support for multiple calling conventions (C, C++, syscalls) across five processor architecture families (ARM, Intel/AMD, MIPS, PowerPC, SPARC) with ports for various operating systems and toolchains.

⟶ `http://dyncall.org`

`rgl` (since 2002) 3D Visualisation System for R using OpenGL as back-end with a portable/modular software architecture, partly based on design patterns. Portable software architecture with back-end drivers for Mac OS X, Windows, Unix/X11 OpenGL Desktop integration for R. This work was done as part of my Diploma thesis and was awared the John Chambers Software Award 2003.



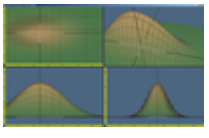
⟶ `http://rgl.neoscientists.org`

⟶ `https://CRAN.R-project.org/package=rgl`

`ff` (since 2007) Big data processing in R using memory-mapped flat binary files as containers for R vector/matrix and data frames. The first version was developed for the *Big Data Programming Competition* at useR 2007 in AMES, USA and our group awarded the first price. Second version received an improved API and indexing schemes.

⟶ `https://r-forge.r-project.org/projects/ff/`

`FShake3D` (2008) GUI Editor for interactive modelling of 2D distributions. The system is implemented in C++. Part of the project is a reusable toollkit for 2D/3D UIs. The software is distributed within the the `WiSP` (*Wildlife Simulation Package*) R package.



⟶ `http://neoscientists.org/~plex/fshake3d/html/index.html`

Awards

Big Programming Competition
R Foundation - R User Conference, Ames, USA (2007), R Package "ff" (Adler, D., Nenadic, O., Gläser, C., Zucchini, W.)

John M. Chambers Statistical Software Award
American Statistical Association - Joint Statistical Meetings, San Francisco, USA (2003), R Package "rgl" (Adler, D.)

Language skills

English	Business fluent (C1)
French	School expertise (A1)

Further courses

2019	Cybersecurity - IT-Security for Medical Products, TÜV-Süd, Cologne
2014	High-level, High-performance Technical Computing with Julia, GWDG
2000	English language course, Intermediate level 1, University of Göttingen
1999	Programming of Parallelcomputers, GWDG
1998	X11 Programming, GWDG
1997	Program-development on UNIX, GWDG

Technical skills

Programming Languages Assembler, Awk, C/C++ (Legacy/Modern), Coffeescript, Erlang, Forth, Java, JavaScript, Kotlin, Lua, Moonscript, OCaml, Perl, Python, R, Ruby, Power/POSIX Shell, Tcl, TypeScript

Operating Systems Android, FreeBSD, iOS, Linux, macOS, Minix, NetBSD, OpenBSD, QNX, Solaris, Windows

Processor Architectures ARM, m68k, MIPS, PowerPC, RISC-V, SPARC, X86

Hardware Platforms Amiga OCS/ECS, BeagleBoard, EdgeRouter, ESP32, Gumstix, PC Engine ALIX & APU, RaspberryPi, R0ket (ARM Corex-M3), Soekris, Vectrex, WRT, Playstation Portable

Tools Autotools, Ansible, Buildbot, CMake, DynASM, Emscripten, Git, Hg, Jenkins, Lex/Yacc, Lemon, Make, Netbeans, Nmake, Packer, Ragel, Svn, Vagrant, Vcpkg, Vim, Visual Studio, XCode

Embedded Tooling CLang/LLVM, GCC, Debian, Gentoo, OpenELEC, OpenEmbedded, OpenWrt, Yocto Linux

APIs and Frameworks ANSI C, BSD Sockets, Bullet, Boost, COM, ffmpeg, FreeType2, GTK+ 1, Java Swing, JNI, Mozilla, NodeJS, Ode, OpenAL, OpenSSL, POSIX, Qt, SDL, STL, SWT, Win32, X11, XPCOM

Computer Graphics OpenGL, DirectX, Shader Programming (Cg, CUDA, GLSL, OpenCL, WebGL), Software Shaders, Game/Simulation Engines, Rigid Physics Engines, 2D/3D GUI Toolkit Implementation

Virtualization and Hardware Emulators bhyve, GXemul, KVM, MirageOS, Parallels, QEMU, NetBSD rump kernel, VirtualBox, VMware, OpenBSD vmm, Xen

Networking ARP, IP4, DHCP, IP6, TCP, SNMP, Anycast, CARP, BGP, PXE Boot

Network Services DNS (bind, nsd), LDAP (slapd), Mail (Postfix, Dovecot, OpenSMTPD), WWW (Apache, lighttpd, nginx, OpenHTTPD)

Security PF firewall administration, DNSsec, X.509 certificate management in Mail- and Web-servers

Research interests

Programming language Middleware for polyglot programming, Application of JIT-Compilation for small executables and foreign function interfaces, live-coding experiments, nifty minimalistic programming-language design.

Cryptography Privacy-Preserving (i.e host-proof) peer-to-peer applications, Blockchain technology and secure encryption/signing-platforms.