Kenny Gruchalla, Ph.D.

Golden, CO kenny.gruchalla@nrel.gov gruchalla.github.io @GruchallaKenny

I am an accomplished scientist and software engineer with over 20 years of experience in data visualization, research, and leadership, across leading scentific institutions such as NREL, NCAR, and NASA. I have led large-scale research projects, managed technical teams, and provided graduate student mentorship. I bring technical expertise, innovative thinking, and a commitment to excellence to any organization. I am primarily interested in developing interactive scientific visualization and analysis techniques that provide tools for finding meaning in increasingly large and complex data.

EXPERIENCE

National Renewable Energy Laboratory (NREL)

Distinguished Member of Research Staff June 2021 – Present

Senior Scientist June 2009 – Present

My core responsibilities include the design and management of a state-of-the-art visualization laboratory, collaboration with NREL domain scientists to visualize complex, large, multivariate data, and frequent interaction with C-level executives to align lab capabilities with their needs and expectations. As a Principal Investigator, I successfully led a portfolio of over $7 million in competitively funded research projects, managing diverse technical teams.

University of Colorado at Boulder

Assistant Professor Adjunct May 2011 – Present

Professional Research Assistant April 2001 – March 2006

I provide mentorship to doctoral-level students in the field of scentific data visualization, supporting the development of gradute students' research skills, including project design, data analysis, software development and effective visualization techniques. In my role as a professional research assistant, I contributed to the design and development of a decision support system for the complex interplay of watershed physical processes, water ownership, and policy.

Colorado State University

Affiliate Faculty October 2021 – Present

As an Advisor for the Richardson Design Center (RDC), I support the development and execution of their graduate certificate program in human-centered design thinking. I bring industry experience and technical expertise to my advising role, providing a valuable resource for faculty and students as they navigate the rapidly evolving field of VR.

National Center for Atmospheric Research (NCAR)

Visitor Appointment May 2006 - October 2008

I collaborated on design and development of VAPOR, a volume visualization suite for interactive exploration of large-scale time-varying multivariate CFD data.

Red Canyon Engineering

Principal Software Engineer June 2003 - June 2009

Software Engineering Consultant June 2000 - June 2003

I directed two NASA-funded projects, the Mars Flight Simulator and Lunar Base Simulator. Additionally, I performed software architecture and algorithm reviews for the Mars Odyssey and Genesis spacecraft programs, ensuring their technical validity and success.

Raytheon

Senior Analyst / Medical Officer July 2000 - February 2001

Technical Software Lead October 1997 - June 2000

Software Developer July 1995 - October 1997

I oversaw the data acquisition and visualization laboratory on the NSF's Antarctic research vessel, the Nathaniel B. Palmer. I also designed and developed advanced meteorological visualization tools for Cape Canaveral and Vandenberg space lift ranges, incorporating real-time and analysis algorithms, as well as image processing software for radar and satellite instrumentation. Additionally, I created a distributed satellite mission planning and scheduling software system, which featured interactive 2D computer graphic models for satellite and ground station resource allocation and 3D modeling tools for satellite payload constraint analysis.

EDUCATION

Ph.D. in Computer Science 2004-2009
University of Colorado 3.9/4.0
Dissertation: Progressive Visualization-Driven Multivariate Feature Definition and Analysis

M.S. in Computer Science 1999-2003
University of Colorado 3.9/4.0
Thesis: Immersive Well-Path Planning: Investigating the added value of immersive visualization

B.S. in Computer Science 1990-1995
New Mexico Tech 3.5/4.0

RESEARCH INTERESTS

Visualization | Decision Support | Immersive Visualization | Perception | Cognition | Workflow Management | Human-Computer Interaction | AR/VR

LANGUAGES

C++ | R | Python | Julia | Lisp | Fortran | JavaScript | OpenGL Shading Language

SKILLS

Research | Technical Management | Software Engineering | Technical Writing | Public Speaking | Proposal Development

PUBLICATIONS & AWARDS

- 50+ publications – 769 citations
  g-index:27, h-index:12, i10-index:16
- 100+ conference presentations including 2 Keynote Talks
- IEEE Senior Member
- NREL Distinguished Member of Research Staff
- APS DFD 2020 Gallery of Fluid Motion Award
- NREL 2017 Innovation & Technology Transfer Outstanding Public Information Award
- NREL 2014 Staff Award for Outstanding Achievement
- DOE ACSR SciDAC 2010 Outstanding Achievement in Scientific Visualization
- Advanced Imaging Magazine 2005 Imaging Solutions of the Year