

Memories of Andreas Griewank

David W. Juedes, November 2nd, 2021.

I will miss Andreas Griewank. He had a great impact on my life and career. I spoke to him via email only a year ago, and he told me of hasty trip back to Germany from Ecuador due to the pandemic. What an amazing and interesting person!

I met Andreas in late 1989 or early 1990 when I applied and was accepted for a semester-long research experience at Argonne National Laboratory in Lemont Illinois. At the time, I was a first or 2nd year graduate student studying Computer Science at Iowa State University. Andreas had been working on his own automatic differentiation package in C++ (ADOL-C) and he needed a student to help him complete it. At the time, C++ version 2.0 had just been released, and I had never heard of automatic differentiation, nor I had ever programmed in C++. (But, I was a very good programmer who had competed in finals of the ACM International Collegiate Programming contest prior to coming to Argonne. So, I picked up C++ pretty quickly. Andreas provided me with a workstation, a copy of Bert Speelpenning's thesis about JakeF (that I still have), and a technical report he had written about the reverse mode of automatic differentiation. So, I got to work on learning about automatic differentiation, C++, and finishing up the code-base for ADOL-C, and writing papers. We published a paper in Supercomputing that year. (He also introduced me to this thing called the world-wide web and the Simpsons!)

I enjoyed my time at Argonne. Andreas was gracious enough to place me in an office right across the hallway from him. So, I saw him every morning when I came into the office. I remember him coming in with wet hair every morning because he loved to get in a morning swim before coming into the office. I also remember the colorful German phrases that he would say when he made mistakes on his computer. I remember him inviting me over for dinner at his house in Joliet to meet Elizabeth and his family. We had several adventures during my time at Argonne. We went skiing in Wisconsin one weekend, we visited the University of Iowa and CADSI, and we took a trip to visit Oak Ridge National Laboratory to visit James Horwedel and others who were doing automatic differentiation in Fortran (GRESS 90). What an adventure!

After I left Argonne the first time, I went back to Iowa State University to complete my Ph.D. in Computer Science. While my official Ph.D. advisor was Jack Lutz at Iowa State, I've always felt that Andreas was my unofficial co-advisor. We published several papers together, and those papers helped me to get my academic position at Ohio University.

Andreas was the driving force in research in Automatic Differentiation. I thought his paper "Achieving logarithmic growth of temporal and spatial complexity in reverse automatic differentiation" was, frankly, amazing. Today, it's great to see the resurgence in interest in automatic differentiation due to the modern AI tools (PyTorch, TensorFlow). I taught a colleague about AD just last year in that context. Over the years, I worked with several graduate students on Automatic Differentiation related projects. Several of my students designed projects that implemented Andreas's ideas about using checkpointing to make more memory efficient versions of the reverse mode. My Ph.D. student, Jeffrey Jones research was inspired by the ideas that I learned while I was working with Andreas. Jeffrey is now on the faculty at Ohio State University.

I will greatly miss Andreas. He has a big effect on my life and the lives of others. My thoughts and prayers go out to his family and those who knew him well.

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