Dr. Anthony D. Cox

Summary of qualifications

- Extensive and detailed knowledge of real-time computer application design, operating systems, architecture, algorithms and optimization strategies.
- Continuing involvement in state-of-the-art control systems, data acquisition, instrumentation, and algorithm design since 1974.
- Excellent verbal and written skills, with the ability to communicate effectively to people at all levels within an organization.
- Demonstrated leadership ability, having hired, fired, motivated, coordinated and supervised programmers and engineers in a variety of complex and 'highly visible' software projects.
- Reputation as a thorough, competent and innovative consultant and designer.

Professional experience

1998 - Present Citrus Controls Inc. Las Vegas, Nevada

President

With a small permanent full-time staff, and a flexible and talented group of contract programmers and engineers hired for specific projects, Citrus Controls provides programming and consulting services for real-time control, data acquisition, and data analysis systems.

I have recently been involved in several complex and high-profile projects, including: -

- Federal Government, having responsibility for the implementation, refinement, characterization, and testing of a number of very high performance real-time signal detection algorithms.
- University Research Facility designing and implementing integration software to consolidate the operational interfaces for the next generation of low emittance particle accelerators.
- Fortune 500 Company, implementing a high-performance, concurrently accessible real-time logging facility. This essential diagnostic tool provides the customer with millisecond resolution of over 15000 control points for rolling mill development.
- Fortune 500 Company, improving vapor deposition tools through the application of asynchronous programming techniques to an existing code base, improving equipment throughput by up to $1000 of product per hour per tool

Citrus Controls has also developed AmirusMM™ software reflective memory, for the support of distributed process control and computational applications.

1996 - 1998 Los Gatos, California

Independent Consultant

After leaving Stanford University, quickly established a reputation as a provider of quality advice and software to a number of Fortune 500 companies, including Varian Associates, Kaiser Aluminum and NASA. The consulting business was Incorporated in California in 1997 and expanded into software development following incorporation in Nevada the following year.

1986 - 1996 SSRL Stanford University, California

Computer Systems Specialist

Reporting to the Director of SSRL (Stanford Synchrotron Radiation Laboratory, Department of Energy), responsible for all aspects of centralized scientific and administrative computing within the laboratory. Specific achievements:

- Recruited a dedicated, enthusiastic group of 6 to support scientific and administrative computing for a laboratory of 140 core staff and over 1000 visiting scientists.
- Specified and supervised the design of intra-laboratory networking, mainframe and workstation hardware, software for data acquisition, data reduction and analysis, and administrative information system support.
- Designed and subsequently led a team of programmers to implement sophisticated real-time data acquisition and control codes for X-ray and ultra-violet spectroscopy, both small-molecule and protein crystallography, small-angle and anomalous scattering, and X-ray tomography.
- Consulted on the data acquisition and control requirements of the Advanced Photon Source (APS), Argonne National Laboratory (DOE Chicago).
- Responsible for control system development of Beam line IX, at that time, the most intense continuous X-ray source in the world.
- On-going responsibility to represent laboratory computing needs to senior management and outside review bodies, defining strategic directions and negotiating for budgets and staffing levels. Represented the laboratory at the National and International level, maintaining close contacts and links with colleagues at other institutions.

1981 - 1986 SSRL Stanford University, California

Research Associate

As a staff scientist, pursued eclectic multidisciplinary research, primarily at Stanford, but including collaborations with “Science City” National laboratory (Tsukuba, Japan), European Molecular Biology Laboratory (Hamburg, Germany) and the Daresbury Laboratory (Warrington, UK).

Research areas have included:

- Error analysis of X-ray spectroscopic data, with particular emphasis

on the accuracy with which inter-atomic distances can be determined in amorphous and organic materials.

- Design and construction of the world's first rotation camera optimized for protein crystallography using synchrotron radiation.
- Applied techniques of simulated annealing to determine the optimum way to construct permanent magnet insertion devices in particle accelerators.
- Calculated theoretical radiation emission spectrum of imperfect electron beam orbits in insertion devices, proving that the Argonne APS would be able to meet design goals.

1978 - 1981 University of Warwick Coventry, UK

Research Fellow

As a postdoctoral research fellow, working primarily at Deutsches Elektron Syncrotron (DESY, Hamburg, Germany), performed research into the structure of glasses and glass ceramics using X-ray spectroscopy techniques.

Taught numerous undergraduate level courses (final year) in theoretical solid-state physics, thermodynamics, and mathematics. Acclaimed as "Best Instructor" in an undergraduate poll.

1974 University of Oxford Oxford, UK

Undergraduate research

Prior to starting graduate studies, worked on the development of the data acquisition system for the 10MV Van de Graff accelerator in the Oxford University department of Nuclear Physics, implementing curve fitting and optimization codes for nucleon decay spectra.

Education

1975-1981 Clarendon Laboratory, University of Oxford, United Kingdom
D.Phil. for thesis entitled "X-ray studies using Synchrotron Radiation"
1975-1981 Hertford College, University of Oxford, United Kingdom
MA Natural Philosophy (Physics)
1972-1975 Hertford College, University of Oxford, United Kingdom
BA Natural Philosophy (Physics) with Honors. Specialist topics atomic physics and theoretical solid-state physics.

Selected Publications

H. Rarback, C. Wermelskirchen and A.D. Cox, "Old Wine in New Bottles - The SPEAR Control System Upgrade", *Presented 7th International Conference on Accelerator and Large Experimental Physics Control Systems* (ICALEPCS 99) Trieste, Italy (1999)

B.E. Patt, J.S. Iwanczyk, R. Szczebiot, G. Maculewicz, M. Wang, B. Hedman, K.O. Hodgson, and A.D. Cox, "The Multi-Element Mercuric Iodide Detector Array with Computer Controlled Miniaturized Electronics for EXAFS," IEEE Trans. *Nucl. Sci*. **42**, 558-564 (1995)

A.D. Cox, "The SSRL Beamline Data Acquisition System", *Rev. Sci.*

Instrum., **63**, 854 (1992)

R. Tatchyn, A.D. Cox and S. Qadri, “Undulator Spectra: Computer Simulations and Modeling”: in SPIE “*International Conference on Insertion Devices for Synchrotron Sources*”, (R. Tatchyn, I. Lindau, *eds*.), **582**, 47 (1985)

A.D. Cox and B. Youngman, “Systematic Selection of Undulator Magnets Using the Technique of Simulated Annealing”, in SPIE “*International Conference on Insertion Devices for Synchrotron Sources*”, (R. Tatchyn and I. Lindau *eds*), **582**, 91 (1985)

R.F. Pettifer and A.D. Cox, “The Reliability of *ab initio* Calculations in Extracting Structural Information from EXAFS”, in: *EXAFS and Near Edge Structure*, (A. Bianconi, L. Incoccia, and S. Stipcich, *eds*.), Springer-Verlag, Berlin, 66 (1983)

A.D. Cox and P.W. McMillan, “An EXAFS Study of a Series of Lithium Germanate Glasses”, *J. Non-Cryst. Solids*, **44**, 257 (1981)

A.D. Cox and J.H. Beaumont, “Polarization Dependence in the X-ray Absorption Spectrum of Zinc Fluoride”, *Phil. Mag*., **B 42**, 115 (1981)

A.D. Cox, “Least Squares Routines for the Analysis of EXAFS Data”, in: *EXAFS for Inorganic Systems,* (C.C. Garner and S.S. Hassnain, *eds*.), Daresbury Laboratory report DL/SCI/R17, Daresbury UK, 51 (1981)

A.D. Cox, “An EXAFS Study of Ruthenium Catalysts”, in: *Characterization of Catalysts*, (J.M. Thomas and R.M. Lambart, *eds*.), John Wiley and Sons, Chichester, 254 (1981)

A.D. Cox, “X-ray Studies Using Synchrotron Radiation”, D.Phil. thesis, University of Oxford, UK, 1980

A.D. Cox, “The Analysis of EXAFS Spectra”: in *Extended X-ray Absorption Fine Structure*, (R. Joyner, *ed*.), Plenum, N.Y., in press

Interests and activities

Aircraft Owner and Private Pilot.
Clark County Aviation Association
Las Vegas Chamber of Commerce
Active FAA Aviation counselor

Security clearance

“Secret” security clearance, currently inactive.