

NORM J. BUCHANAN

Curriculum Vitae

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Education

PhD Physics, University of Alberta (2003)

Research Positions Held

- Research Scientist II: Department of Physics, Colorado State University (2008 – present)
- Postdoctoral Fellow: Florida State University - D0 Experiment at Fermilab (2003 – 2008)
- Graduate Student: Department of Physics, University of Alberta – Radiation Qualification of Digital Controller for ATLAS Liquid Argon Calorimeter (1999 – 2003)
- Graduate Student: Department of Physics, University of Alberta – Study of a Readout System for the ATLAS Liquid Argon Calorimeter (1996 – 1998)
- Summer Student: Department of Physics, University of Alberta (1995)
- Summer Student: Department of Physics, University of Alberta (1994)

Relevant Research Experience and Leadership Roles

- **D0 Run Coordinator (2007-2008)**
Responsible for the efficient operation of the D0 detector, including the approval and coordination of all maintenance and detector improvements, as well as extended shutdowns. Liaison between the D0 collaboration and the Fermilab accelerator division.
- **Leader of the D0 Calorimeter Group (2005 – 2008)**
Responsible for maintaining stable operation of a particle physics detector including: minimizing downtime due to hardware and software failures, following up on issues that could affect data quality, prioritizing repair and upgrade tasks, and managing group personnel (approximately 10 people).
- **Trigger Board Representative for the D0 New Phenomena Physics Group (2004)**
Ensured that all physics needs of the New Phenomena group were met by the experiment trigger through testing and communicating with members of the group.
- **D0 Level 2 Trigger Software Manager (2004)**
Responsible for ensuring that new software for the experiment-wide distribution (> 600 collaboration members) was prepared on time, as well as operational.
- **Analysis of data collected by the D0 detector (2004 – 2008)**
Analyzed physics data using C++ based framework employing a variety of modeling and statistical techniques.
- **Software Developer - D0 Silicon Track Trigger Simulation Package (2003)**
Developed trigger simulation code to interface with the overall experiment simulation framework using C++.

- **Developed an x-ray testing facility (320 kV) (2000-2003)** Constructed an x-ray facility, which included ensuring that radiation levels in surrounding areas met safety limits, and developing dosimetric calibration. Performed radiation hardness testing using the facility.
- **Radiation qualification of digital electronics for a high-energy physics experiment (1999-2003)**
Developed a framework for testing field-programmable gate arrays and application-specific integrated circuits. Tests were performed to emulate a variety of radiation environments using x-rays, protons, and neutrons.
- **Testing of prototype readout system for the ATLAS calorimeter (1996-1998)**
Tasks performed included gathering data at a remote laboratory (CERN in Switzerland) and determined hardware performance using a variety of analytical and statistical methods.
- **Development of front-end readout for a prototype liquid-scintillator based cosmic ray detector (1995)**
Built a front-end readout using modular electronics.

Teaching Experience

- **Graduate student supervision (2003-2008)**
Supervised students at a National Laboratory (Fermilab) from several international institutes (Florida State University, Freiburg University, State University of NY Stony Brook, Marseilles, Delhi)
- **Sessional Lecturer: Physics 395 – Electronics and Instrumentation, Department of Physics, University of Alberta (2002)**
Developed and taught 3rd year physics course (approximately 20 students)
- **Teaching Assistant, Department of Physics, (introductory and advanced laboratories), University of Alberta (1996-2002)**
Performed demonstrations, as well as assisted and graded students
- **Computing Seminars, Department of Physics, University of Alberta, (1997,1998)**
Developed seminars to teach UNIX to new department members.

Committee and Board Representation

- Member of the Technical Readiness Review Board for the D0 Run IIb Level 1 Calorimeter Trigger Upgrade (Aug 2006)
- D0 Trigger Board Representative for the New Phenomena Physics Group (2004)
- Member of D0 Editorial Board: *New phenomena searches with heavy-flavor jets* (2004-2008)
- Department of Physics Computing Committee: Graduate Student Representative (1999-2003)
- Department Council (Department of Physics): Subatomic Graduate Student Representative (1998-2003)
- Graduate Student Association Council: Department of Physics Representative (1996-1997)