Wojtek Furmanski

Vitae

Wojtek Furmanski is Research Professor of Physics and Associate Director of NPAC. In his Theoretical Physics PhD and the following postdoctoral research, conducted in Cracow Poland, CERN Geneva, DESY Hamburg, Orsay Paris and Caltech, he was studying scaling violation phenomena and renormalization group techniques in Quantum Chromodynamics. He developed diagrammatic techniques for systematic analysis of scaling violation beyond leading order and performed the first complete calculation for the two loop parton densities. This work is now a standard reference in high energy physics.

At Caltech, he joined the Caltech Concurrent Computation Program (C^3P) and he conducted research on optimal collective communication algorithms for parallel machines. He was also a member of the Computation and Neural Systems (CNS) program at Caltech where he conducted multidisciplinary research on use of neural networks for load balancing parallel computation, on use of parallel processing for neurophysiological simulations of cortex and on multigrid algorithms for early vision. He also started at Caltech the development of the MOVIE (Multitasking Object-oriented Visual Interactive Environment) System, with the overall design inspired by lessons learned in exploring parallel processing and neuroscience.

MOVIE is now further developed at Syracuse University as one of NPAC's core technologies for High Performance Distributed Computing. So far, MOVIE has been used for the GIS (terrain image understanding) applications for the U.S. Army and as the backend support for High Performance Fortran Interpreter. The system is now further developed as an infrastructure software and integration environment for interactive HPCC systems and applications in the areas such as parallel compilers and interpreters, virtual reality and televirtuality based information systems for modern science education.

Current work in this area is focused on integrating MOVIE and Mosaic/WWW technologies and developing a collection of next generation webtools for multiuser hypermedia communication and interactive Internet services.

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Education:

- PhD, 1978, Theoretical Physics, Jagellonian University, Cracow, Poland.
- Habilitation, 1981, Theoretical Physics, Jagellonian University, Cracow, Poland

Academic Employment:

- Associate Director of NPAC, Syracuse University, 1991 –
- Research Professor in Physics, Syracuse University, 1990 –
- Member of Professional Staff, Caltech Concurrent Computation Program, 1986 — 1990.
- Senior Research Fellow, Caltech, High Energy Physics, 1983 — 1986.
- CRNS Research Fellow, Orsay University, LPTHE, Paris, France, 1982 — 1983.
- Scientific Associate, CERN/TH and Geneva University, Geneva, Switzerland, 1981 — 1982.
- Assistant Professor, Jagellonian University, Cracow, Poland, 1979 — 1981.
- Scientific Associate, CERN/TH, Geneva, Switzerland, 1978 — 1979.
- Assistant, Theoretical Physics, Jagellonian University, Cracow, Poland.

Selected Publications

Theoretical High Energy Physics

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- R. K. Ellis, W. Furmanski and R. Petronzio, "Power corrections to the parton model in QCD", Nucl. Phys. B207–1, 1982.
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- Faigle, C., Fox, G.C., Furmanski, W., Niemiec, J. and Simoni, D., "Integrating Virtual Environments with High Performance Computing", paper submitted to the 1st IEEE *Virtual Reality Annual International Symposium*, VRAIS'93, Sept 18–22, Seattle, WA.
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  - HPSIN itself (as an umbrella project)
  - MOVIE (Multitasking Object-oriented Visual Interactive Environment)
  - HPFI (High Performance Fortran Interpreter)
  - HPCGS (High Performance Coarse Grain Distributed Computing Support)
  - Virtual Reality and Televirtuality – A technology assessment project.

  Pages in this HPSIN space contain also a link to REFERENCES which offers on-line version of most recent papers up to the end of '94. Some '95 references are currently linked on the http://kayak.npac.syr.edu:2005 server in /WebTools/Potpourri.html

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