Prof. Alireza Haghighat

Director of Nuclear Science and Engineering Laboratory, Viginia Tech.

Joint Meeting of the
VA Section of the American Nuclear Society
and
VA Section of the American Society of Mechanical Engineers

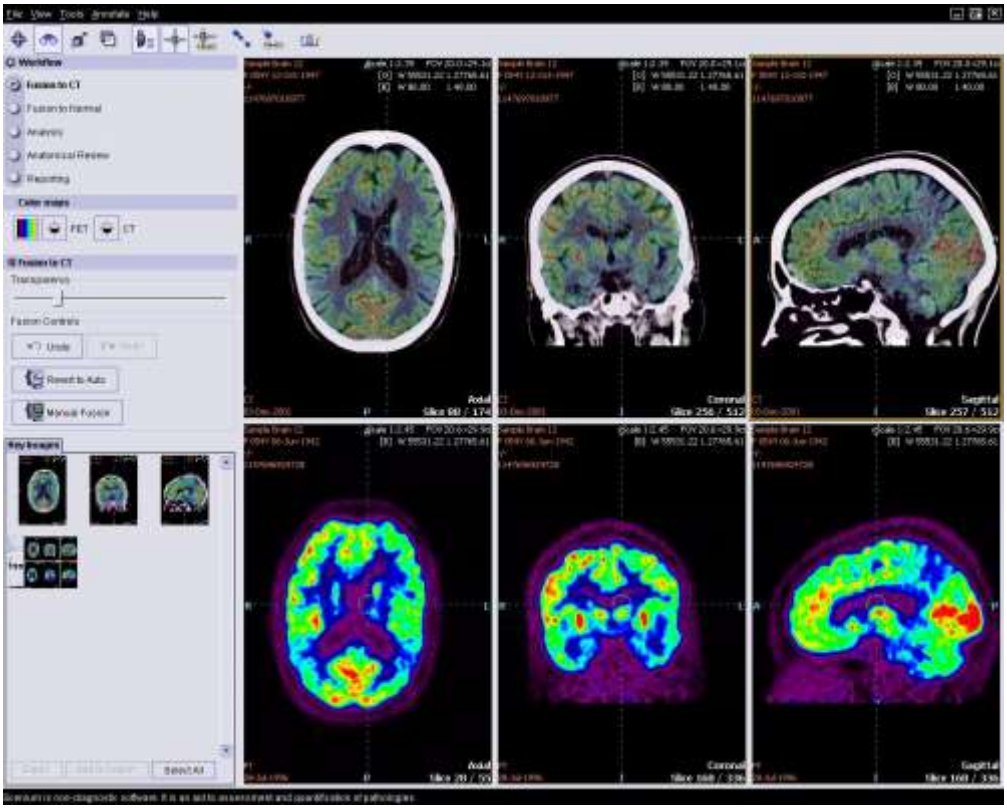
Thursday, December 13, 2012 - Hilton Garden Inn, Lynchburg, VA at 5:30 PM

Advanced Hybrid Transport Methodologies for Medical Imaging to Yield Accurate Results in Real Time

Prof. Haghighat will briefly introduce the Nuclear Engineering Program at Virginia Tech and its research activities. He will introduce the Nuclear Science and Engineering Lab (NSEL) in Arlington, VA, and his research group, Virginia Tech Transport Theory Group (VT3G), which is engaged in research activities in nuclear power, nuclear non-proliferation and safeguards, and radiation diagnostics.

Prof. Haghighat will introduce the audience to the two main approaches, deterministic Sn and Monte Carlo, approaches used for particle transport simulation in nuclear systems. He will elaborate on the advantages and shortcomings of the approaches, and discuss the need for development of hybrid methodologies. He will introduce the SPECT (Single Photon Emission

Computed Tomography) which is used for functional imaging of the human heart, and discuss development of a novel hybrid particle transport formulation, which is being considered for the SPECT image reconstruction in real-time.



(Image courtesy of http://www.medical.siemens.com)

Speaker Biography:

Dr. Haghighat served as the chair of both the Nuclear Engineering Department Heads Organization and the International Advisory Council for the Nuclear and Quantum Engineering Department at the Korean Advanced Institute of Science and Technology. Dr. Haghighat moved to the Virginia Tech campus in January of 2011, leaving his post as the Florida Power and Light Endowed Term Professor at the University of Florida. At the Florida campus, he started as the chair of the nuclear and radiological engineering department in 2001, and spent eight years in this position. Dr. Haghighat, a fellow of the American Nuclear Society, currently serves as the chair of the board of the Southeast Universities Nuclear Reactors Institute for Science and Education.

Dr. Haghighat is recognized internationally for his research in particle transport methods and their applications in the simulation of nuclear systems, parallel computing for nuclear applications, Monte Carlo methods, reactor physics, perturbation techniques, design of nondestructive interrogation systems for homeland security applications, simulation of nuclear reactors, radiation systems, and medical devices. Also, he has been involved in design and licensing of digital control and protection systems for nuclear reactors.

Dr. Haghighat has worked with and/or provided consulting for different international organizations, notably: Belgian Nuclear Research Centre; French Atomic Energy Commission; Electricite de France; Organization for Economic Co-operation and Development-Nuclear Energy Agency Data Bank of France; AREVA Gmbh of Germany, a subsidiary of AREVA NP; Siemens of Germany; Korea Power Engineering Company; Korean Advanced Institute of Science and Technology; Mitsubishi Heavy Industries; Mitsubishi Research Institute; Nuclear Power Engineering Corporation; Japan), Tokyo Electric Power Corporation of Japan; Osaka University of Japan; Moscow Engineering Physics Institute of Russia; National Tsing Hua University of Taiwan; and the Institute for Nuclear Energy Research of Taiwan. In the U.S., he has provided consulting for: the Department of Energy; Department of Homeland Security; Nucsafe Inc.; Nuclear Regulatory Commission; Global Atomic Inc.; and Babcock and Wilcox Owner's Group. He also has served as an International Atomic Energy Agency expert.

Dr. Haghighat has published over 210 papers in refereed journals, conference proceedings and transactions. He has received several best paper awards, and has given numerous invited lectures, short courses, and plenary talks at national and international meetings and organizations. During his time as department head at the University of Florida, he grew the reputation and enrollment of Florida's nuclear program. It became a top ten nuclear graduate program within eight years of his arrival, and there was more than a three-fold increase in the number of students studying in the program.

Schedule:

- Social Hour - 5:30 p.m.
- Dinner - 6:00 p.m.
- Presentation - 6:45 p.m.
- Adjourn - 8:00 p.m.
- Directions to the Hilton Garden Inn
    - 4025 Wards Road
      Lynchburg, VA 24502
      (434) 239-3006

COST: $30 ($20 for students) includes dinner. It is possible to arrange for vegetarian or special needs meals. Registration has closed for the meeting as they needed to be received by 4 p.m. on Monday, December 9, 2012. Please address any questions to Ruwan Ratnayake (434) 229-1460.