Graduate Telecommunications and Networking Program
Summary 2007-2008 Academic Year

The past academic year was one of change in the Telecommunications and Networking Program. In October 2007, Professor Richard Thompson stepped down as program chair and was succeeded by Associate Professor David Tipper. Additionally, Professor Taieb Znati left on leave to the National Science Foundation through 2009. With these changes and the continuing decline in enrollment, the Telecom Program faculty spent time on benchmarking in terms of comparing the curriculum, enrollment and marketing against other programs. Additionally, the chair, solicited advice from department heads on campus and spoke with the heads of Telecom Programs at Colorado, Maryland, Syracuse, UT-Dallas, SUNY-Utica, DePaul and U. Penn. Also, the faculty spent time researching the job market both locally and nationally.

As a result of this effort, we concluded that while the curriculum compared favorable with other Telecom programs a major problem was a lack of hands on practical experience in the computer networks area. Hence, the faculty modified the curriculum adding a required laboratory course for students entering Fall 2008. Dr. Walter Cerroni from the University of Bologna was hired as a visiting Professor for the Spring and Summer 2008 to replace Dr. Znati in the class room and to lead the development of a networking laboratory course. Dean Larsen generously funded the laboratory effort. Additional curriculum changes included modifying the MST requirements to 37 credits by requiring a one credit seminar course focused in part on developing closer ties to industry through invited speakers from local companies and developing soft skills (e.g., writing) in students.

At the Ph.D. level, the degree was restructured to be consistent with other Pitt programs (CS and EE), reduce the time required and improve the research quality. Specifically the total number of course credits required was reduced by 6 credits, while implementing a required core set of five courses, and allowing the admission of exceptional Bachelor's student directly to the Ph.D. program.

The program formed an Industrial Advisory Council (IAC) which met in April 2008. The purpose of the IAC is to provide advice on the curriculum, research and the overall direction of the Telecom field. The members of the IAC are listed below.

1. Tom Sands, VP of Engineering, ECI Telecom
2. Vincent Trost, Director Software Engineering , Ericsson
3. Dr. Ravi Jain, Engineering Manager, Google
4. Dr. Sujata Banerjee, R&D Project Manager, Hewlett Packard Labs
5. Dennis Smith, Head of Advanced Engineering, Bank NYMellon
6. William Garrett, Director, Mass Market Technology, Verizon
7. Eric Dunmire, Senior Manager of Network Engineering, Consolidated Communications.

It is worth noting that Mr. Trost and Mr. Dunmire are MST Alumni. The IAC were given an overview of the Telecom Program course offerings and The IAC were enthusiastic about the new laboratory course and had a number of useful curricular and marketing suggestions. Notable comments included closer linkage of the Telecom program with the BS I.S. degree as this has the greatest potential for student enrollment growth. Moving the course offerings more towards the applications rather than physical layer

communications, changing the name of the degree program (Information Networking was suggested) and de-emphasizing the MST degree.

Additional changes in the Telecom program included implementing a written exit interview of MST students with an optional one-on-one interview. Organizing summer internship opportunities for MST students (this resulted in students interning at ECI Telecom, Qualcomm and Compunetix this past summer).

The end result of the changes in the program was an increase in the enrollment for the Fall 2008 term (6 MST Fall 2007, 20 + 4 full time non-degree seeking students Fall 08). However, the Fall class is largely international (80%), while the job market is strong it is largely oriented toward U.S. citizens.

Notable accomplishments outside of the curriculum efforts above, include graduating a record number of Ph.Ds (10) and a number of new externally funded research and educational awards involving Telecom Faculty as listed below.

Awards 2007-2008

1. R. Hayden, M. Weiss, ``Kosovo Telecommunications Education Project,'' *USAID Higher Education Development Grant,* 7/01/08- 6/30/11, $450,000
2. D. Tipper, J. Joshi, and P. Krishnamurthy, ``Dynamic Data Driven Defense Mechanisms for Cybersecurity,'' *National Science Foundation CSR-SGER Program* 8/1/07-7/30/09, $104,000
3. P. Mohapatra, S. F. Wu, K. Levitt, J.J.Garcia-Luna-Aceves, T. La Porta, G. Cao, S. Krishnamurthy, M. Faloutsos, P. Krishnamurthy, D. Tipper, S. Kasera, L. Swindlehurst, ``ARSENAL: A cross layer Architecture for Secure resilient tactical mobile ad hoc networks,'' *Army Research Office MURI Grant ,* 7/01/07 – 6/30/12, $6,500,000 (University of Pittsburgh portion $715,000).
4. P. Krishnamurthy, "Coping with Jamming Attacks in Ad Hoc and Mesh Networks,"*National Science Foundation NeTS*, 9/1/07 – 31/8/10, $149,998

Continuing Grants

5. J. Joshi, P. Krishnamurthy, M. Spring, D. Tipper, "A Scholarship Program for Security Assured Information Systems Track," *National Science Foundation Federal Cyberservice Program*, 8/11/06 – 8/11/10 , $1,055,553.

Grants Completed 2007-2008

6. D. Mosse and D. Tipper, ``Advanced Networking for Instrumentation and Control of Nuclear Powered Ships and Submarines**,"** *Bechtel Bettis Inc.*, 5/01/07-8/30/07, $50,000.