

# Phillip T. Conrad

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## Current Position

### **Asst. Professor (Sep. 2003 – present)**

Dept. of Computer and Information Science, University of Delaware, Newark DE  
Continuing Non-tenure track appointment, with emphasis on Teaching and Service

### **Teaching Responsibilities:**

- **Coordination, Course Design and Delivery of introductory course sequence**
  - Sequence includes CISC105, CISC181, CISC220
    - (Corresponds to "CS0,CS1,CS2" in commonly used terminology).
    - Introductory sequence for all Computer Science majors/minors
    - Also key service courses for Math, Math Education, and Engineering (esp. Elec. and Computer)
  - Key Responsibilities
    - Overall course design, including syllabus, content, selection of texts, design of labs/projects
    - Oversight of instructional staff for these courses
    - Teaching these courses on a frequent basis.
- **Coordination, Course Design and Delivery of CISC474, "Advanced Web Technologies"**
  - Senior-level elective course in software development methods for web-based system; new course number, previously taught as special topics course by Bob Caviness (retired).
  - Redesigned course based on "Problem-Based Learning" techniques
  - Course emphasizes key design patterns (e.g. Model-View-Controller) and team software development techniques in addition to specific technologies (Java Servlets, Java Server Pages).
  - Most enrollees are graduating seniors; PBL approach stresses skills particularly relevant to future employers: communication skills, team-work, independent learning.
  - Teach course once per year (Spring, starting with Spring 2005)
- **Coordination, Course Design and Delivery of CISC103, "Intro. to C.S. with Web Applications"**
  - New Introductory course similar to CISC105 (CS0 level) but with emphasis on web development;
  - First course in four-course sequence for new Interactive Media Minor.
  - Teach course once per year (Fall, starting with Fall 2004)
- **Coordination, Course Redesign and Delivery of CISC106, "General Computer Sci. for Engineers"**
  - New Introductory course similar to CISC105, but using MATLAB
  - Part of new "common first semester" for College of Engineering
  - Designed a curriculum with emphasis on engineering applications of MATLAB programming, with a short C++ unit to facilitate transition to CISC181 (for Electrical and Computer Engineers)
  - Teach multiple sections of course (each Fall starting with Fall 2006)

## Current Position (continued)

### Asst. Professor (Sep. 2003 – present)

Dept. of Computer and Information Science, University of Delaware, Newark DE

Continuing Non-tenure track appointment, with emphasis on Teaching and Service

## Service Responsibilities

- **Assessment Fellow**
  - Coordinate CIS Department activities related to university-wide Outcome Based Assessment Efforts
- **Interactive Media Minor program committee**
  - Coordinator, Fall 2006-present
    - Chair meetings of the committee
    - Work with registrar's office and dean's office to coordinate affect of UDSIS upgrades on procedures for admitting students to the minor
    - Process applications to the minor (about 15 per year), and senior checkout for students in the minor (about 10 per year)
    - Coordinate upgrades to website for minor
  - CIS Dept. Representative, Spring 2004-present
- **Ph.D. Committee Service**
  - Served on Ph.D. committee for Armando Caro (graduated 8/2005)
  - Served on Ph.D. committee for Jana Iyengar (graduated 5/2006)
  - Serving on Ph.D. committee for Preethi Natarajan
- **Undergraduate Independent Studies**
  - Peter Steijn, *Improving The Performance Of Object Pools: Non-Blocking Object Generation*, (Undergraduate Thesis for Honors Degree with Distinction), Spring 2005
  - Adam Christian, *XML Processing of Computer Science Exam Questions*, Spring 2006
  - Jason Grafinger, *PHP/MySQL Tutorials for CISC474*, Spring 2006
  - Matt Claypotch, *AJAX Tutorials for CISC103/CISC474*, Spring 2006
- **Other Service**
  - Undergraduate advising
  - Representing the department on the Transfer Matrix Committee (consisting of representatives from computing-related departments at UD, Delaware State University, and Delaware Tech)
  - ACM Student Chapter advisor
  - Graduate teaching assistants orientation
  - Serve on undergraduate committee

## Education

- **Ph. D., Computer Science**  
**University of Delaware**, Newark, DE; December 2000
  - Dissertation: Partial Order and Partial Reliability Transport Service Innovations in a Multimedia Applications Context. Advisor: Paul D. Amer.
  - Frank Pearson Award in 1995–1996. Annual Award by the University of Delaware to the most outstanding graduate student in the Dept. of Computer and Information Science.
  - University Competitive Fellowship: 1994, 1995, and 1996.  
Tuition waiver and \$11K stipend awarded to 20-30 students annually from a graduate student population of over 3000. (not renewable; each year is a separate competition.)
  - GPA: 3.91/4.00.
- **M. S., Computer Science**  
**West Virginia University**, Morgantown, WV, December 1988.
  - Thesis: Typesetting of Music Notation with TeX. Investigated the approach suggested by Gourlay et. al. in a *Communications of the ACM* May 1986 cover story.
  - Received “Outstanding Graduate Assistant” award for 1987 for Dept. of Statistics and Computer Science.
  - GPA: 3.79/4.00.
- **B. S., Computer Science, *magna cum laude*,**  
**West Virginia Wesleyan College**, Buckhannon, WV, May 1985.
  - “Outstanding Senior,” Class of 1985.
  - GPA: 3.78/4.00

## Grants

### Awarded

Principal Investigator, *TCP Enhancements for Wireless Battlefield Networks*. \$62,500 subcontract from Army Research Lab, part of Collaborative Technology Alliance in Battlefield Networks, administered as subcontract to Temple University through University of Delaware (Jun 1 2001, through Sep 30 2002).

Principal Investigator, *Reliable On-the-move Sessions*. \$50,000 renewal of subcontract from Army Research Lab, part of Collaborative Technology Alliance in Battlefield Networks, administered as subcontract to Temple University through Telcordia Technologies (Oct 1 2002, through Sep 30 2003). Renewable through FY2005, with option for granting agency to extend renewal through FY2008.

### Submitted (not funded)

Principal Investigator, *Classification of Router Services*. Proposal to NSF, Div Of Advanced Networking Infrastructure & Research. Proposed for three years, 9/01/2002-08/31/2005, direct costs \$216,890, total costs \$326,419, (includes \$38,700 subcontract to Univ. of Penn. for co-PI Jonathan Smith.)

Co-PI, *Connecting Interests with Computing Careers for minorities, women and students with disabilities*. Proposal to NSF, Division of Computer and Network Systems, Broadening Participation in Computing. Proposed for three years (FY 2006-2008), Total Proposal: \$600,660 UD subcontract (\$29,175)

### Refereed Journal Articles

1. M. U. Uyar, J. Zheng, M. A. Fecko, S. Samtani, P. T. Conrad. Evaluation of Architectures for Reliable Server Pooling in Wired and Wireless Environments. *IEEE JSAC Special Issue on Recent Advances in Service Overlay Networks*, 22 (1) (12/2004), pp. 164-175.
2. Sami Iren , Paul D. Amer , Phillip T. Conrad. The transport layer: tutorial and survey. *ACM Computing Surveys*, 31 (4) (12/1999), pp. 360-404.
3. Paul D. Amer, Sami Iren, Gul E. Sezen, Phillip T. Conrad, Mason Taube, Armando Caro. Network-conscious GIF image transmission over the Internet. *Computer Networks*, 31 (7) (1999) pp. 693-708
4. Rahmi Marasli, Paul D. Amer and Phillip T. Conrad An analytic study of partially ordered transport services. *Computer Networks*, 29 (6) (1997) pp. 675-699.
5. Paul D. Amer , Christophe Chassot , Thomas J. Connolly , Michel Diaz , Phillip Conrad. Partial order transport service for multimedia and other applications. *IEEE/ACM Trans on Networking*, 2(5), (10/1994) pp. 440-456.

### Refereed Conference Publications

1. P. Conrad , A. Caro , P. Amer. ReMDoR: Remote Multimedia Document Retrieval over Partial Order Transport. *Proceedings ACM Multimedia 2001*. 09/2001, pp. 169-180.  
(Note: one of only 45 papers accepted from 280 submissions; 16% acceptance rate).
2. P. Conrad, G. Heinz, A. Caro, P. Amer, J. Fiore. SCTP In Battlefield Networks. *Proceedings IEEE MILCOM 2001*. 10/2001.
3. J. Mulik, P. Conrad, Y. Shi. Simple Reliable Multicast for Parallel Processing in Extended LANs. *Proceedings 25th Annual IEEE Conference on Local Computer Networks (LCN2000)*, 11/2000, pp 437-438.
4. P. Conrad, B. Greenstein. Teaching Network Performance Measurement Using Java When The Students Don't Already Know Java. *Proc PDPTA, 1999, Las Vegas, 7/1999*.

5. P. Conrad, P. Amer, M. Taube, G. Sezen, S. Iren, A. Caro. Testing environment for innovative transport protocols, Proc. IEEE MILCOM '98, Boston, 10/1998
6. S. Iren, P. Amer, A. Caro, P. Conrad, G. Sezen, M. Taube. Network-conscious compressed image transmission over battlefield networks. Proc IEEE MILCOM '98, Boston, 10/1998
7. S. Iren, P. Amer, P. Conrad. NETCICATS: Network-conscious image compression and transmission system. Proc 4th Int'l Workshop on Multimedia Information Systems, Istanbul, Turkey; published as: Lecture Notes in Computer Science, Vol. 1508, Springer Verlag, 9/1998
8. S. Iren, P. Amer, P. Conrad. Network-conscious compressed images over wireless network. Proc 5th Int'l Workshop on Interactive Dist'd Multimedia Systems and Telecom Services (IDMS '98), Oslo, Norway, Lecture Notes in Computer Science, Vol. 1483, Springer Verlag, 9/1998
9. Paul D. Amer, Sami Iren, Gul E. Sezen, Phillip T. Conrad, Mason Taube, Armando Caro. Network-conscious GIF image transmission over Internet. Proc 4th Int'l Workshop on High Perf Protocol Architectures (HIPPARCH '98), London, 6/1998
10. R. Marasli, P. Amer, P. Conrad. Metrics for quantifying partially ordered transport services. Proc 6th Int'l Conf on Telecommunication Systems, Nashville, 3/1998
11. R. Marasli, P. Amer, P. Conrad. Partially reliable transport service. Proc IEEE ISCC '97 - 2nd Symp on Computers and Communications, Alexandria, Egypt, 7/1997.
12. P. Conrad, P. Amer, E. Golden, S. Iren, R. Marasli, A. Caro. Transport QoS over unreliable networks: no guarantees, no free lunch! 5th IFIP Int'l Workshop on Quality of Service, Columbia Univ, 5/1997, 315-318.
13. R. Marasli, P. Amer, P. Conrad. Optimizing partially ordered transport services for multimedia applications. Multimedia Modeling: Towards The Information Superhighway, (Courtiat, Diaz, Senac, eds), World Scientific Pub Co, 1996, 185–204.
14. R. Marasli, P. Amer, P. Conrad. Retransmission-based partially reliable transport service: An analytic model. Proc. IEEE INFOCOM 96, San Francisco, 3/1996, 621-629.
15. P. Conrad, E. Golden, P. Amer, R. Marasli. A multimedia document retrieval system using partially-ordered/partially-reliable transport service. Proc. Multimedia and Computing Networking 96, San Jose, 1/1996.

## Technical Reports

1. A. Caro, P. Amer, P. Conrad, G. Heinz. Improving Multimedia Performance Over Lossy Networks via SCTP Fifth Advanced Telecommunications and Information Distribution Research Program (ATIRP) Conference (Army Research Laboratory), College Park, MD, 3/2001
2. A. Caro, P. Amer, S. Iren, P. Conrad. Web integrating network-conscious image transmission. Fourth Advanced Telecommunications and Information Distribution Research Program (ATIRP) Conference (Army Research Laboratory), College Park, MD, 3/2000
3. P. Conrad, P. Amer, E. Golden, S. Iren, A. Caro. Partially-ordered, partially-reliable transport service for multimedia applications First Advanced Telecommunications and Information Distribution Research Program (ATIRP) Conference (Army Research Laboratory), College Park, MD, 1/1997 pp. 215–220.

## Invited Workshops, Seminars, Colloquia:

1. P. Conrad, P. Amer, R. Marasli. Graceful degradation of multimedia documents via partial order and partial reliability transport protocols. IEEE Workshop on Multimedia Synchronization, Virginia, 05/1995
2. R. Marasli, P. Amer, P. Conrad, G. Burch. Partial Order Transport Service: An Analytic Model. Proc. 9th IEEE Workshop on Computer Communications, Marathon, Florida, 10/1994.

## **Internet RFCs**

1. R. Stewart, M. Ramalho, Q. Xie, M. Tuexen, P. Conrad.  
Stream Control Transmission Protocol (SCTP) Partial Reliability Extension, RFC3758, May 2004
2. T.Connolly , P.D.Amer, P. Conrad. An Extension to TCP: Partial Order Service.  
RFC 1693, November 1994

## **Demonstrations/Poster Sessions**

- “Testing Environment for Innovative Transport Protocols,” Poster/Short Paper for Advanced Telecommunications Information Distribution Research Program (ATIRP) Consortium Conference, College Park MD, January 1998.
- “Partially Ordered and Partially Reliable Service for Multimedia Applications,” Demonstration for Advanced Telecommunications Information Distribution Research Program (ATIRP) Consortium Conference, College Park MD, January 1997.
- “A Multimedia Document Retrieval System Using Partial Order and Partial Reliability Transport Service.” Computer Science Dept. Colloquium, Villanova University, April 1996.

## **Professional Service**

- Program Committee, Panels Chair, ACM Multimedia 2003
- Reviewer, IEEE Infocom 2001
- Reviewer, Addison-Wesley:  
Data Structures and Problem Solving Using C++, 2<sup>nd</sup> edition, Mark. A. Weiss, 2000
- NSF Proposal Review Panel, 1997
- Reviewer, IEEE Infocom 1996
- Reviewer, ACM SIGCOMM 1995

## Previous Research and Teaching Related Work Experience

**Asst. Professor (Sep. 2001-May 2003)**

**Instructor (Sep 1998-August 2001)**

Dept. of Computer and Information Sciences, Temple University, Philadelphia PA

### Research

- 12 papers; four include Temple students as co-authors
- PI on ARL CTA grant (details elsewhere on CV)

### Teaching

- Supervised 7 completed MS student projects (complete list appears later in CV)
- Taught undergraduate and graduate courses: received excellent peer and student evaluations.
  - CIS662, Computer Networks and Communication  
(Graduate survey course in networks)
  - CIS320, Computer Networks and Communication  
(Senior undergrad elective, survey course in networks)
  - CIS750, Advanced Topics in Networking  
(Graduate seminar course, with focus on research methods)
  - CIS067, Program Design and Analysis.  
(Introductory C++ programming course for undergraduate computer science majors.)

### Service

- Faculty advisor to undergrad Temple University Student ACM chapter  
During my service as chapter advisor:
  - Membership increased from 75 to over 180
  - Received ACM Student Chapter Excellence Award for three consecutive years:
    - Outstanding Chapter Activities, 2001-2002 (tie with USMA, West Point)
    - Outstanding Community Service, 2000-2001
    - runner up for Outstanding School Service, 1999-2000
- Coordinated orientation for graduate teaching assistants.
- Member, CIS dept. research committee, Undergraduate committee

## Research and Teaching Related Work Experience (continued)

- **Visiting Lecturer**

Dept. of Computer and Information Science, University of Delaware, Newark DE, Sep.'96-May '98.

- Taught Data Structures (using C++) Fall '97 (50 student lecture), Spring '98 (16 student honors section)
- Taught Introductory C++ course for CIS majors (CIS181) Spring '98 (80 student lecture section).
- Taught Programming Languages (mixed Undergrad/Graduate section, 30 students), Fall '97
- Taught CISC856, "Upper Layer Protocols," in both Fall '96 and Spring '97. This is an advanced graduate seminar course covering the design of protocols for the Transport, Session, Presentation and Application layers of the OSI and TCP/IP protocol suites, with an emphasis on the TCP/IP suite. Topics: TCP, UDP, FTP, telnet, DNS, NFS/RPC, HTTP, multicast RTP for audio/video, reliable multicast (e.g. SRM), CORBA, X.500, T/TCP.
- Received excellent evaluations from students.

- **Research Assistant**

Dept. of Computer and Information Science, University of Delaware, Newark DE, Sep.'93-Aug.'96

- Participated in research on topic of formal protocol specification, and partially-ordered and partially-reliable transport service under research grants from the National Science Foundation, Army Research Office, and the Advanced Telecommunications Information Distribution Research Program (ATIRP) Consortium.
- Supervised and directed work of two undergraduate researchers, and two M.S. students.
- Developed experimental software testbed, including (1) a remote multimedia document retrieval system (REMDOR) incorporating synchronized graphics and audio, using X-Windows. (2) a user-level transport protocol testing library (UTL).

- **Graduate Teaching Assistant**

West Virginia University, Morgantown, WV, Sep.'85–Dec.'87.

- For three semesters, Lecturer for CS1, the introductory course for CS majors. For two semesters, Lab Assistant for CS1, leading two weekly 2 hour lab sessions.
- Developed textbook materials for using Ada as the introductory programming language for CS1 in support of Carnegie-Mellon software engineering research project. Validated materials by using them in class for one semester, resulting in students successfully mastering basic software engineering and Ada programming concepts.

- **Corporate Trainer**

E. I. Du Pont de Nemours and Company, Du Pont Information Systems, Wilmington DE.

- Developed and taught cross-training classes for LAN support staff to enable personnel to become proficient in a wider range of technologies. Results included better coverage of network support, and better utilization of resources. (October 1991—August 1992).
- As **MOS Training Coordinator**, Aug.'88-Aug.'90, designed and managed employee training for a software development organization of over 70 programmers responsible for maintaining and enhancing the MOS system. Results included productivity, quality and teamwork improvements.

- **Lecturer, VAX Training Classes**

E. I. Du Pont de Nemours and Company, Belle, WV, Dec.'87.

- Taught half-day and full-day employee training courses in basic VAX commands, and use of Datatrieve, a database query language.

## Other Professional Work Experience

- E. I. Du Pont de Nemours and Company, Du Pont Information Systems, Wilmington DE.
  - **Senior Analyst/LAN Specialist.** October 1991–August 1992.  
Designed, implemented and supported Novell, IBM, DEC and Apple Local Area Networks, using Ethernet and Token Ring.  
Developed and taught cross-training classes (see under “Teaching and Research related work experience.)
  - **PC Integration Team Leader, Scientific Computing Division.**  
August 1990–October 1991.  
Led a team investigating methods to more effectively integrate Macintosh and DOS PCs into the computing infrastructure of Du Pont’s Research and Development facilities. Evaluated emerging distributed computing technologies and architectures in terms of cost/benefit, support requirements, and scalability.
  - **Staff Analyst, Customer Service and Distribution Systems Section,**  
August 1988–August 1990.  
Designed and implemented enhancements to the Multidepartmental Order System (MOS), a large (>5 million lines of code) IMS/DB2 application used as order entry, pricing, inventory, shipping and invoicing system for Du Pont businesses worldwide.  
Served as MOS Training Coordinator (see under “Teaching and Research Related Work Experience).  
Received **Accomplishment Award** from Du Pont Electronics Connectors business for improvements to functionality enabling “Just-In-Time” product manufacture and delivery.
- MountainNet Inc., Dellslow WV.  
**Technical Resource, November 1987–February 1988.**
  - Assisted the Vice-President of a small entrepreneurial company in developing documents detailing business and technical plans for establishment of the National Ada Software Repository, in fulfillment of a NASA contract.
  - Duties included technical writing and editing, consulting on usage of TeX and LaTeX, programming on VAX/VMS systems using POISE information management software, and evaluation of existing bulletin board systems for NASA technology transfer.
- Du Pont Company, Belle, WV.  
**Programmer, System Manager, Summers from 1984--1987.**
  - Performed system management and programming for business data processing systems including accounting, inventory, environmental data, and payroll, on DEC systems including VAX/VMS, PDP 11-70, RSTS/E.
- West Virginia Wesleyan College, Buckhannon WV.  
**Departmental Assistant, Educational Media Services, 1982–1984.**
  - Performed systems analysis and programming to automate record-keeping for the Education Media Services department. Used POISE information management software on DEC PDP 11-70 systems.

## Continuing Education

- *Effectively Evaluating TCP Performance – Methodologies and Tools*, Tutorial by Mark Allman and Shawn D. Ostermann, IEEE MILCOM 2001.
- *SMIL 2.0, The Next Wave Of Multimedia On The Web*. Tutorial by Lloyd Rutledge, ACM Multimedia, 2001.
- *Unix Kernel Internals*, Short Course (3.0 CEUs) by Mike Karels and Kirk McCusick, UCLA Extension, July 18-22 1994.
- *Protocol Design and Performance*, Tutorial by David D. Clark, IEEE Infocom '95.
- *Distributed Multimedia Systems*, Tutorial by John F. Buford, IEEE Intl. Conf. on Multimedia Computing and Systems (ICMCS '94). May 1994

## MS Projects Supervised at Temple University:

John Millaway, MS Student, Performance Evaluation of Technologies for Dynamic Web Content

John Jacob, MS Student, Sockets API implementation for SCTP

George Adams, MS Student, NS-2 Simulation of Multi-user Game Protocols

Marc Jasner, MS Student. BXXP application level framework.

Alvaro Arcila, MS Student. NS-2 simulation of HTTP with embedded objects

Jean Dorrian, MS student: Performance evaluation of streaming wavelet compressed video

John Fiore, MS student, Performance evaluation of out-of-sequence transport layer protocols

Ben Greenstein, MS Student: Adaptive algorithms for streaming wavelet compressed video.

Ramu Konidena, MS Student: Issues in porting experimental network software.