The Center for Cyberspace Research was established in March 2002. We conduct defense focused research at the Master’s and PhD levels. We are forward-looking and responsive to the changing educational and research needs of the Air Force, the DoD, and the federal government. CCR was designated as a National Security Agency (NSA) National Center of Academic Excellence in Information Assurance Education (CAE/IAE) in 2002, recertified in 2005 by the NSA and the Department of Homeland Security, and tentatively recertified in 2008. In 2005, we received national CyberCorp Institution status from the National Science Foundation.

Our strong research ties with AFCYBER (P), Autonomic Trusted Sensing for Persistent Intelligence Office at AFRL, the NSA, the Defense Advanced Research Projects Agency (DARPA), the Air Force Information Operations Center (AFIOC), and the Air Force Communications Agency (AFCA) is unique among institutions conducting cyber research. We conduct both classified and unclassified research; faculty and students hold security clearances and can conduct research at the Top Secret/SCI level.

CCR faculty possesses a wealth of knowledge and experience in communications, networking, and information security gained through DoD operational assignments before joining the faculty. Be sure to read the “Faculty Focus” article on Major Paul Williams inside.

Our graduate Cyber Operations and Cyber Warfare programs support one of the federal government’s and DoD’s most critical missions – Computer Network Operations (CNO). DoD component element missions require rapid development and response on a global scale, our graduates therefore, must understand the technical and managerial roles associated with these complex cyber mission requirements. CCR gradu-
“Cyber Warriors” Win Digital Forensics Challenge

A team of four Computer Science and Cyber Operations graduate students from the Center for Cyberspace Research combined their cyber skills and interests in digital forensics to field a team in the annual DoD Cyber Crime Center (DC3) Challenge for 2007. This highly competitive event brought together 126 teams from commercial, government, civilian, military, and academic institutions to highlight tools, techniques, and procedures that address the most troubling issues DC3 faces.

Using innovative techniques, the team cracked passwords, repaired damaged media such as CDs, DVDs, and a thumb drive, extracted hidden information from audio files, and dissected digitally altered photos to accrue points in the challenge. In the end, AFIT’s team, “Cyber Warriors” consisting of Maj. Andy Hansen, Al-Nath Tuting, Capt. Dorsey Wilkin, and 1st Lt. Mike Kolbe, took the Grand Champion trophy. Our students represented the Air Force and CCR in a superb manner by placing first among the 126 teams. Challenges such as these demonstrate the value of graduate education and research and highlight the talents the Air Force is developing in support of the AFCYBER mission.

Faculty Focus: Major Paul Williams

Major Paul D. Williams is an Assistant Professor of Computer Science at the Air Force Institute of Technology. He is also the Deputy Director for the Center for Cyberspace Research and Chief of the Computer Science and Engineering Division of the Department of Electrical and Computer Engineering. He plays a critical role in educating the Air Force’s future leaders in the fields of computer science and cyber warfare as well as directing cutting edge research in these fields. Since joining AFIT’s faculty, Major Williams has made significant contributions to CCR and its support of the AF’s development of Cyberspace as a warfighting domain.

“I consider myself very lucky to be part of CCR. CCR’s people are terrific, we have great collaborative relationships within the Air Force academic, research, and operational communities, and opportunities to tackle challenging and important problems. This equates to a fantastic work environment!”

Paul is an aggressive researcher in six key cyber thrusts, serving as research advisor for 11 MS students and as a committee member for 15 others. Serving in an outreach role, he played a key role in helping the Air Force develop a way ahead in organizing, training, and equipping a cyber force. He helped organize and lead three separate cyber education and training workshops in 2007, and served on the Air Staff A3/5 Cyber Force Development Working Group. These activities are leading to the creation of a new family of Cyber Warfare career forces. In 2007, Paul gave 25 invited presentations or consultations and had 9 papers published.

Major Williams is a career Communications and Information Officer. He received his master’s degree in Computer Science from AFIT in 2001, and subsequently worked at the Air Intelligence Agency. He entered the AFIT faculty pipeline in 2002 and completed his PhD in Computer Science from Purdue in 2005.
Cyber Research Award

CCR is pleased to announce the establishment of the Cyberspace Research Excellence Award. The award is given in recognition of master’s-level research that advances Air Force capabilities in or understanding of cyberspace. The honoree will reflect the highest standards of academic and professional accomplishment during their participation in the Institute’s graduate programs.

Research deemed worthy of this award will have made exceptional contributions to the scientific, management, or engineering knowledge in cyberspace. Consideration is given to originality, resourcefulness, completeness, scope, clarity of presentation, and level of difficulty. The nature of the research (i.e., scientific versus engineering, or theoretical versus experimental) is not a consideration.

The recipient will also demonstrate outstanding academic performance by having a high cumulative grade point average (GPA) in all graduate courses taken in resident AFIT programs. The first award is tentatively scheduled to be awarded March 2008.

Cyber Alumni Profile: Major Timothy Franz
Chief of Force Development, AFCYBER (P)

March 2007 saw the first graduates of AFIT’s newest Master’s program, Cyber-space Operations. Among these was Major Timothy Franz whose research developed an Information Operation career field and presented a “way ahead” for the Air Force. His thesis was the first to offer such comprehensive strategies for the development of a professional force in this arena and earned him top honors upon graduation.

Major Franz’ research examined Information Operations as a whole and identified capability gaps that have prevented the DoD from fulfilling national-level directives to create a professional IO career force. He made four recommendations: establish a Network Warfare force, establish an Influence Operations force, deploy OPSEC Red Teams and full-time OPSEC Managers at the base and MAJCOM level, and integrate Information Operations into the training provided to all Airmen. Of these four recommendations, Major Franz’ work delved most deeply into the establishment of a Network Warfare force, where he investigated current challenges and outlined an implementation concept that will serve as a baseline for force development. He also developed an innovative model for conceptualizing operations in all domains of warfare, including air, land, sea, space, and the electromagnetic spectrum. Within this model, cyberspace is visualized and its relationship to other warfighting domains is demonstrated.

While Major Franz’ research specifically focused on network warfare, his extracurricular efforts included all aspects of cyberspace operations, to include provision and sustainment, network warfare, and electronic warfare. Key among these efforts he organized and conducted three cyber education and training workshops in 2007 during which subject matter experts from across the Air Force and DoD were brought in to shape the way ahead. Major Franz’ activities caught the eye of leadership at Air Staff and Eighth Air Force and he was assigned to Barksdale AFB, Louisiana to help stand up the new Air Force Cyber Command.

Following graduation from AFIT, Major Franz served on the 8 AF Commander’s Concept and Strategy Cell where Lt. General Robert J. Elder laid the groundwork for a new Cyber MAJCOM. Today, Major Franz is Chief of Force Development for the Provisional Air Force Cyber Command. In this role, he develops strategies and leads efforts to create the Air Force corp of cyberwarfare professionals. His team, in collaboration with organizations across the Air Force, are working to craft new specialties and career paths, formalize training and education pipelines, establish qualification and evaluation standards, and develop strategies to transition existing forces into the new cyber career fields.