SAB Meeting Minutes

Department of Computer Science
North Carolina State University
Minutes of Meeting
April 7, 2005

The Department of Computer Science Strategic Advisory Board met at the Monteith Engineering & Research Center (formally the EGRC) on Centennial Campus on Thursday, April 7, 2005.

Members in Attendance: Nicholas Bowen, Wayne Clark, Keith Collins, Chris Crump, Chris Evans, Jo Goodson, Ken Hibbard, Vivien Joklik, Steve Kuekes, Kathy Markham, Gerhard Pilcher, Juan Vargas, and Steve Worth.

Member Regrets: Rowland Archer, David Daugherty, Dennis Flynn, Satish Gupta, Gopal Kakivaya, Gayle Lanier, Rudy Puryear, Bill Riddick, Kristopher Tyra, and Bill Weiss

Presenters & NCSU Representatives in Attendance: Dr. Mladen Vouk, Ken Tate, Dr. David Thuente, Dr. Dennis Bahler, Dean Nino Masnari, Ron Hartis, David Winwood, Dr. Doug Reeves.

Department Review – Interim department head, Dr. Mladen Vouk, opened the meeting with an overall "state-of-the-department" review highlighting the department's strengths & successes, its current challenges, and a look at moving the department forward in the future. In particular, the following items were discussed, many of which became focal points for continued discussion and input throughout the day:

- Successful ABET/CAC accreditation; anticipate formal approval this summer (UPDATE – full accreditation confirmed August 2005)
- External review of department completed as part of department head search – overall results extremely positive
- Move to new building on Centennial Campus on track for August 2005 (UPDATE – classrooms opened on schedule; faculty, staff & labs to follow, hopefully by end of 2005)
- Department in 38th year of operation; major celebrations planned for 40th Anniversary
- Alumni base approaching 4,700; department consistently ranks in top 3 nationwide in Bachelor degrees awarded*
- Faculty has grown to over 40, ranking department in top 3 nationwide in faculty size*
- CRA projects that seven of the 20 fastest growing jobs through 20012 will be in the IT field. Unfortunately, US universities are expected to fall significantly short of producing an adequate supply of CSC new grads to meet this demand
- Key areas of expertise and research strength for the department include: theory, systems, artificial intelligence, networks, security, and software engineering.
- Research expenditures now rank us in top 15 nationwide*
- Research support continues to increase; future goal is to increase ratio of research to state funding to 2:1 or better. Major focus in future on growth of new centers.
- Resolving Intellectual Property concerns continues as a focus for the department, as it has major implications to our popular cap-stone senior design project course
- Considering a new funding & faculty utilization model which more accurately reflects the faculty life cycle (allowing for a dedication to either teaching or research, or a blend)
- Department very involved in the launch of the university's high performance and grid computing capabilities.
- Virtual computing labs being designed as way of delivering on-demand applications to students and reducing costly physical lab infrastructure.
- Department continues to see growth in corporate partnerships and related support

- Curriculum enhancements in the future to focus on: improved hands-on project courses that engage outside partners, courses that teach and help foster competitive knowledge, innovation, and best practices, and courses that focus on new technologies such as "grid" and high-performance computing, allowing our students to stay ahead of the curve.

* Based on 2003 ASEE Profile data

Graduate Program Review - Dr. David Thuente, director of graduate programs for the department, provided an overview of the tremendous growth experienced in recent years by our graduate program. While overall CSC enrollment is decreasing, the graduate program enrollment has increased approx. 36% since 2001, and is nearing capacity. PhD enrollment, now at 127, has more than tripled in the last four years resulting in a significant increase in PhD degree awards in the last year. We have established a strong reputation internationally, evident in the ever increasing number of international students who do not request or require financial aid. Our GP strengths include the quality of our students and faculty, the strength of our new faculty, our recruiting abilities, our growing reputation internationally, and strong work-study opportunities we have through our corporate partners and local industry. Issues faced by the GP include: the requirement of more financial support from industry for RAs, overall graduate school funding not increasing with increased enrollment, the timing of oral prelims, and completion time for PhD candidates. Overall, our graduate program which was officially launched just over 12 years ago, is now beginning to come into its own.

Undergraduate Program Review - Dr. Dennis Bahler, director of undergraduate programs for the department, patiently waited through a schedule rearrangement to provide his overview. Tribute was paid to previous department head, Dr. Don Martin who recently passed away. Department currently ranks 8th in nation in undergraduate enrollment. After peaking in 2002-03, department has had an 11% fall in degrees conferred, far below the 25% fall experienced nationwide. Within the College of Engineering, only two departments awarded more undergraduate degrees in 2004 than in 1994: ECE and CSC. An accelerated BS/MS degree program is now offered. Curriculum enhancements focused on increasing teaming and communications skills, as well as ethics, safety, security, and quality. Department's strategy is to produce leaders and innovators, not technicians, fit the curriculum to the future, teach specific engineering principles first and programming second, and assess the opportunity to add alternative tracks and concentrations.

College of Engineering Review – Dean Nino Masnari provided a comprehensive overview of the college, its recent successes and future direction. The dean spoke to the numerous awards and top rankings amassed by the CoE in the past year, and provided an update on the ongoing migration of the college to Centennial Campus. Of particular note, the CoE now ranks 11th nationally in the number of female faculty and 8th in the number of African-American faculty. He showed a comparative graph showing the top department in the CoE in terms of Research Expenditures per Faculty Member is MSE at over $458K / faculty member. CSC ranks 8th out of 9 departments at just over $137K / faculty member. Acknowledgement was made that most other CoE disciplines are more hardware intensive; therefore you could expect them to be slightly higher. However the challenge has been issued to the CSC faculty to increase this average in order to reach its potential as a key player on a national scale. During Q&A, when asked for a position on Intellectual Property, the dean indicated that a position was being developed and suggested that the SAB might want to come forward with a strong position as a group.

Tour of EBII – Board members were taken via bus to the new EBI facility for a brief tour by Ron Hartis. Our new facility will look very much like EBI when completed. After a brief review of the Naming Rights opportunities, the group was treated to an exclusive "behind-the-scenes" tour of the new EBII building. A great deal of work remained at the time. Subsequently, contractors were reallocated to ensure classrooms opened on schedule in August 2005.

Lunch & Centennial Campus Presentation – During the working lunch, board members were joined by David Winwood, recently appointed director of Centennial Campus. David discussed the history of the campus, current building projects, and future plans. In addition to EBI & EBII, other notable construction on Centennial includes the new Park Alumni Center, the Friday Institute, and a new chancellor's mansion. Despite tremendous growth, the campus is just over 20% built-out at this point. With the addition of lake-front condos, a planned restaurant, and the long-range plans for a hotel, conference center, and golf course, the campus is slowly emerging into its vision as a "destination". Feeding the growing Centennial population and transporting students quickly and safely between campuses remains two of the biggest challenges Winwood and his staff face. UPDATE – Port City Java recently announced plans to place a café in EBII by the end of the year.

External Relations Review – Being pressed for time, Ken Tate deferred his time to other speakers after giving a very brief update on alumni and corporate relations efforts. Ken noted that a new branding campaign and department logo have been launched and we continue to migrate collateral as updates take place. A new departmental eNewsletter has been launched receiving very positive feedback from all target audiences. The department web site has also been updated recently with a new look and enhanced functionality. The total number of corporate partners grew by approx. 6% last year with the ePartners Program generating over $230K in unrestricted funds to the department. For the 2nd straight year, a major endowment has been launched. SAB members Keith Collins, Chris Crump and Jo Goodson made five-year pledges to seed the new Diversity in Computer Science Endowment, a fund which will support scholarships and outreach programs designed to increase the attraction and retention rate of females and minorities in the field of computer science. During the meeting, Steve Worth joined the trio in making a donation to the fund. **NOTE: Since the meeting, Kathy Markham and her husband, Bruce, have made a significant multi-year pledge in support of the Diversity Endowment. Total pledges to the fund now exceed $70K. All SAB members are encouraged to consider how they can support this or some other need the department has.**

Research Spotlight - Network Security - Dr. Doug Reeves provided the board an overview of the research he and his colleagues have been doing in the Cyber Defense Lab on network security. Their approach at addressing escalating Internet-based security threats involves use of packet timing for correlation, watermarking the timing to facilitate correlation, and use of error correction techniques to make the scheme robust against timing perturbation by an attacker. Details are available in his chart package.

CSC Strategic Planning Committee Review – Dr. Doug Reeves provided board members a brief overview of this committee's work in progress, in which strategies are emerging across several different areas. Discussed the concept of faculty opting into a "teaching" or a "research" track, which could positively impact some performance indicators which currently undervalue teaching. Department curriculum has also matured to the point where it now may be time to consider developing concentrations or special interest tracks at the undergraduate level. The committee is also reviewing the department's overall portfolio. Recommendation made that this committee should take a lead role in identifying those curriculum strengths (actual and/or desired). NSA's recent re-designation of NCSU and the department as a Center of Academic Excellence in Information Assurance Education makes a strong statement to the strength of our security program. Areas of strength discussed included Theory, Systems, AI, Networks, Security, and Software Engineering. Comment made that these are analogous to the "plumbing" and the challenge is how do you match these with faculty and centers, and market this side instead of the plumbing? Comment made that Dr Vouk's "cyberinfrastructure" concept may hold the key - where the focus is on making "applications dramatically easier to develop and deploy"

Trends, Drivers & Recommendations – A spirited and interactive discussion followed the formal presentations. Board members made numerous suggestions and comments, which were documented by board members, Chris Crump and Steve Worth. Feedback can very generally be categorized as follows:

- **Board Meeting Content / Structure** – Good variety of topics and speakers this year. Candidness appreciated regarding state-of-the-department. Effectiveness of time spent touring new facility debatable. Missed student engagement and interaction; requested we bring that back next year. Need more time for open discussion by board members.
- **Quality of Instruction** – Specific comments made that department needs to focus on ensuring its instructional staff can communicate effectively and that they allocate an adequate amount of time for student interaction.
- **Department Identity & Strengths** – Several areas of perceived strength were discussed including AI, Networks, Security, and Software Engineering. Recognition that NCSU is best kept secret in Computer Science. Challenge remains as how to most effective get our "good news" stories out to shape perceptions - how to translate strengths which some may categorize as "plumbing" into tailored pitches that could be driven at unique audiences. Suggestion made that the department should be opportunistic and focus strengths in particular areas where it can use its resources to make a big splash such as bioinformatics, nano technology, gaming, and/or information security.
- **Department Maturation & Trends** - Has growth in PhD program had any impact on quality of undergraduate program? Need to expand number of "centers" accepted as source of additional research funding; what are opportunities for adding centers? Lack of system architecture skills for system integration raised as a general issue by SAB members. Innovation noted as a future issue for our economy, and question raised; what are we doing to teach / foster entrepreneurship?
- **Strategic Direction of Department** – board would like to see strategies as developed by the Strategic Planning Committee. Of particular interest is the concept of having dual teaching and research tracks. What does this really mean and how will it work? Development of "concentrations" and specialized tracks also of interest.

Wrap-up – Prior to closing the meeting, chairperson, Keith Collins, asked the board members to consider personally supporting the new Diversity in Computer Science Endowment, as the SAB will have an active role in recommending how the funds are allocated on an annual basis. We need the endowment to grow to at least $150K in order to provide substantial funds each year to support diversity scholarships and recruitment/retention programs. Candidates for the two leadership roles (chair and vice-chair) were also solicited. Several suggestions were made for potential leadership candidates and they will be worked off-line with communications to all board members in the coming months. Special thanks to Network Appliance for their sponsorship of the dinner at Bogart's.

Immediate Actions & Follow-up

1) Share w/ SAB opportunities for expanding research centers (prime - Dr. Vouk)
2) Distribute "public" component of reaccreditation report and external review document (K. Tate)
3) Share w/ SAB department's strategic direction for review & input (Faculty Str Plng Committee)
4) What peer institutions do we want to be like – share peer report (Dr. Vouk)
5) Review details of campus analytics NCSU/SAS proposal to see how we leverage this to CSC advantage (K. Collins / K. Tate)
6) Provide board members access to PCAST study and federal innovation report (K. Collins)
Board members are asked to read and promote to legislators and voters. Links to reports are located at http://www.ostp.gov/PCAST/FINALPCASTSECAPABILITIESPACKAGE.pdf and http://www.compete.org/nii/