19 October 2016

Via Email

Dear Provost Beeson:

I am pleased to provide the attached report of the September 19-20, 2016 SIS
Board of Visitors meeting. As in the past, Dean Larsen and I worked together to
prepare the report and we shared the draft of it with Board members, who were
given an opportunity to make comments which have been incorporated into the
final report.

The meeting consisted of updates from Dean Larsen and from chairs of SCI
planning committees on activities related to the proposal to consolidate SIS and CS
into a new academic unit. Dean Larsen reviewed the university level approval
progress and process and remaining steps to bring the proposal to the Board of
Trustees for approval in October 2016.

We also heard reports from the incoming (interim) Department Chairs on how each
proposed department is approaching its role and mission; how collaborations with
other Pitt units might advance or impede the interests of faculty and students; how
they might advance Pitt's strategic priorities; and how they envision their
departments working.

Collaborations with pharmacy were cited as laying an extensible foundation for
interdisciplinary activities.   Professors of Practice Babichenko and Mitchell
discussed regional partnerships that support Pitt's strategic plan and Professor
Joshi discussed his proposed Cybersecurity Center.

Michael Depew reviewed the i3 program which is now in its 6th year. Results are
encouraging, thanks to the generous support of the AW Mellon Foundation, but the
program is now beginning its third 3-year grant to support its operations. The AW

Mellon pattern has been to provide funding to launch programs such as this and to support them long enough for them to demonstrate success. Their expectation is that successful programs will be sufficiently attractive at that point to become sustainable through other funding sources. Even though i3 has three more years of AW Mellon funding, the Board believes that now is the time to develop sustainable sources of support. The Board is making several recommendations for new funding, including gifts-in-kind which Pitt should consider. We believe strongly that the program should continue through a combination of internal and external funding support.

The BOV was very pleased with the School's progress and we applaud the faculty of SIS and CS for their cooperation in building for the future. As we stated last year, we believe you and Chancellor Gallagher are positioning Information and Computing at Pitt to be a center of gravity on campus through leadership, collaboration and service.

The SIS BOV is delighted to have had an opportunity to review and contribute to the development of SCI. We thank Dean Larsen and you for your leadership and your ongoing support of the initiatives underway. We believe Pitt is moving in the right direction and that great possibilities are ahead. SCI is a bold undertaking and we urge you to implement it in a timely fashion, driven by strategy vision rather than academic convention.

Sincerely.

Alfred L. Moyé, Chair
SIS Board of Visitors

SIS Board of Visitors
Meeting Summary
September 19-20, 2016

Board members present included:

Raheem Beyah	Gary Byrd	Claudia Gollop
Mary Frances Cooper	Charles Isbell	Robert Strauss
Alfred Moyé, Chair	Keith Schaefer	David Holtzman
James Williams	Bill Isler	Mike Macedonia
Cynthia Richey	Roger Glunt	James Matarazzo

Laurie Kirsch representing the Provost's Office

School of Information Sciences faculty and staff present included:

Sheila Corrall	Ronald Larsen, Dean	Carolyn Loether
Debbie Day	Robert Perkoski	Jeff Lawson
Martin Weiss	Sandra Brandon	Leona Mitchell
David Tipper	Sharon Bindas	Prashant Krishnamurthy
Roger Flynn	Wesley Lipschultz	Paul Munro
Daqing Hé	James Joshi	Michael Depew
Richard Cox	Dmitriy Babichenko	Liz Lyon
Kelly Shaffer		

Department of Computer Science faculty and staff present included:

Taieb Znati, Chair	Rami Melhem	Donald Bonidie

Chair Alfred Moyé opened the meeting at 9:00 am, welcoming those in attendance. He then asked **Dean Larsen** to introduce the agenda and to review progress since the last Board of Visitors meeting. Materials presented and discussed at the meeting are available online at www.sis.pitt.edu/sisbov.

The userid is "sisbov" and the password is "limited5access".

The agenda can be viewed at http://www.sis.pitt.edu/sisbov/meeting/agenda.html. The Dean's report is at http://www.sis.pitt.edu/sisbov/documents/Dean's%20Update%20BOV%202016%20fall.pdf. Most noteworthy in his report was the presentation of the proposal for the new School of Computing and Information (see http://www.sis.pitt.edu/sisbov/documents/SCI%20Proposal%20030716.pdf for the text of the proposal and http://www.sis.pitt.edu/sisbov/documents/NewSchoolProposal-BOV_PPT.pdf for the presentation materials).

Review of the proposal and its implications consumed most of the Board members' energies during the course of the meeting. The following summarizes the Board's findings and recommendations to the Provost.

SCHOOL of COMPUTING and INFORMATION (SCI)

This is a bold undertaking... make it so, and make it timely (driven by *vision* rather than convention).

The Board endorses the SCI vision (figure 1) that links the core strengths of SIS and CS to the strategic needs and interests of Pitt as expressed in the university's strategic plan. This is a useful and relevant expression of an appropriately bold and urgent vision for the SCI. The Board concluded, however, that the initial organizational structure (figure 2), designed to minimize the upheaval in launching the School within current constraints, is inadequate to support the visionary ambitions of both the School and the University. The Board, therefore, recommends a clearer and more timely transition strategy to evolve to an organizational structure that explicitly reflects the mission and vision of the SCI.

This may be established through "intellectual neighborhoods" that loosely aggregate faculty, fostering development of interdisciplinary interests, where neighborhoods easily cross departmental boundaries (an artifact of the current university structure), both within SCI and beyond. Once these "neighborhoods" are established and SCI faculty members are collocated, a more coherent organizational structure should emerge, based on overarching themes.

Figure 3 attempts to illustrate this more pictorially. SCI faculty would determine the set of intellectual neighborhoods (as well as the eventual overarching themes). The ones shown are drawn from the current proposal for the SCI and are only

Figure 1 SCI vision

Figure 2 Initial Organizational Structure

intended to illustrate a line of thought and a process that could ultimately point the way for the final structure of the new School.

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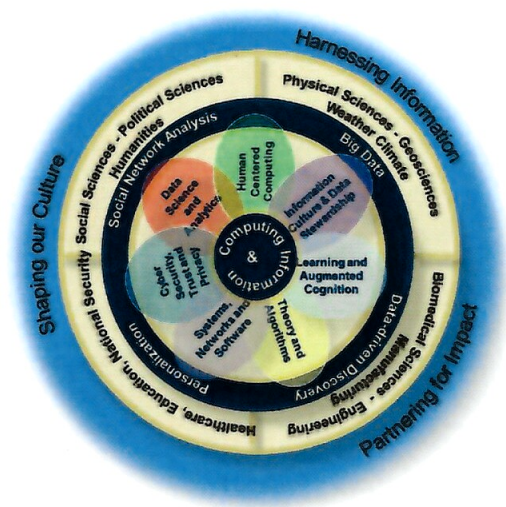**Overarching Themes**
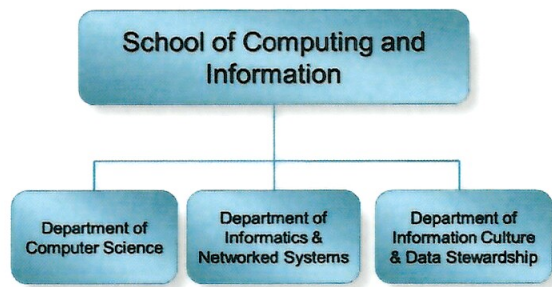
Initial Departments

	Theory & Algorithms	Systems, Networks, & Software	Cybersecurity, Trust & Privacy	Human-Centered Computing	Learning & Augmented Cognition	Data Science & Analytics	Digital Stewardship	Information Culture
Computer Science	X	X	X	X	X	X	X	x
Informatics & Networked Systems	X	X	X	X	X	X	x	X
Information Culture & Data Stewardship	x	X	X	X	X	X	X	X

Computing at the Extremes

Synergistic Computing in Education

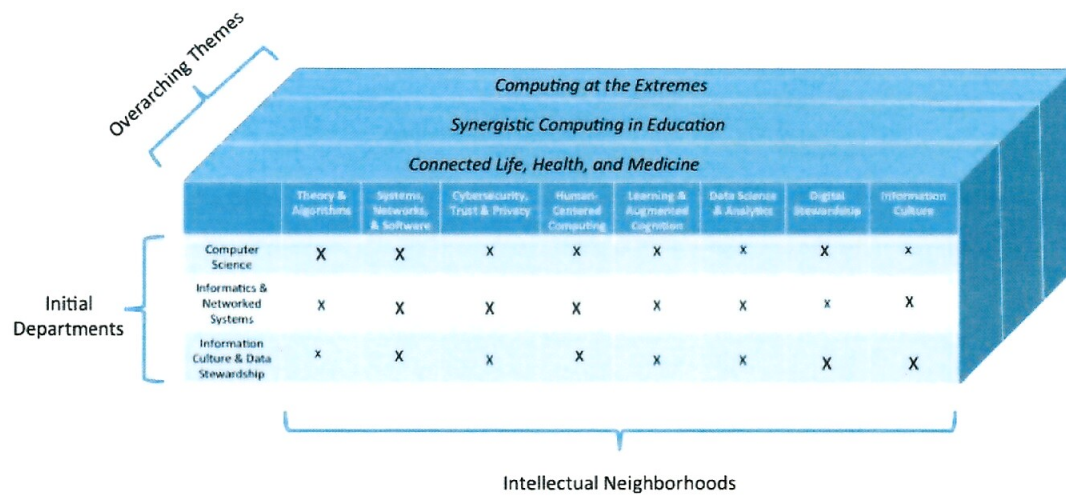*Connected Life, Health, and Medicine*

Intellectual Neighborhoods

Figure 3 Creating an organization reflecting mission & vision

Beyond the organizational issues, Pitt needs to commit to making SCI the bold undertaking it truly can be, and to reflect this in faculty hiring and composition, budgets, facilities, policies, and a host of related factors. The Board notes that "Contextually Situated Computing" provides an appropriate and useful foundation for expressing the novel approach that Pitt and the SCI bring to this bold venture.

The Board's discussion with SIS and CS faculty and staff revealed some additional considerations worthy of the attention of the Provost and the Chancellor.

1. **Hiring**: Faculty hiring needs to be accelerated for positions that are known to support the strategic directions of the SCI. Faculty in cybersecurity, information culture, and data science, for example, are needed now, and their recruitment should not be delayed. The Board further endorses James Joshi's proposal for establishment of a Cybersecurity Center ("CyRes" available at http://www.sis.pitt.edu/sisbov/documents/Cybersecurity_Proposal_2016June1.pdf) and recommends hiring an interim director and three post-doctoral fellows as a start. The Chancellor's leadership role nationally in cybersecurity would seem to make development of such a center at Pitt a reasonable priority. When the SCI has its first dean, the school will then be in a position to further build a world-class organization through strategic senior hires and through disciplinary cluster hires.

2. **Incentives**: Faculty members clearly understand the value and importance of interdisciplinary collaboration, but they are also motivated by the inherent values, incentives, and reward structures of the academy (which tend to inhibit interdisciplinary work, especially for pre-tenured faculty). The Board encourages the Provost to accelerate progress by adjusting faculty incentives and reward structures to align with university priorities and ambitions for the SCI.

3. **Undergraduates**: The Board firmly believes that the SCI needs an early commitment to building a **strong undergraduate program** that begins with the freshman year and provides entering students clear paths to the full range of SCI degrees. Interdisciplinary education takes time; it takes more than two years and

engages multiple campus organizations. Co-op programs and related experiential learning opportunities need to start early, as do research experiences for undergraduates. A 4-year program also builds stronger alumni who identify with the School, as well as the university.

Recognizing that adding a 4-year SCI undergraduate program into a university environment with a stable mix of 4-year and upper-division programs is not accomplished without competition for resources, the Board believes that this should, nonetheless, be a priority. Board members strongly encourage an early commitment of the necessary resources to support a full undergraduate SCI program, while there is still flexibility, momentum, and a focus on the centrality of the new school to the University's strategic ambitions.

> **Georgia Tech College of Computing (Charles Isbell)**
>
> "Many students take double majors, minors, and related cross-disciplinary programs. The full 4-year undergraduate program greatly facilitates the students' ability to pursue these types of student explorations. Computing is fundamentally interdisciplinary, and building core knowledge and expertise takes time. Four years provides students the opportunity to explore the connections between computing and disciplines outside the immediate program. Internships and co-ops are integral to the GaTech degree, and it is more effective and productive to introduce these to students early (even in their first year). The earlier that students get into the program, the earlier they can also engage in research. This provides obvious benefits to the school (by expanding the capacity for research), to the students (by building their intellectual depth and breadth), and to the University (by supporting minors, double degrees across schools, and an array of service courses)."

The Penn State College of Information Science and Technology (IST) recently launched an undergraduate program in Data Sciences and is presently updating their Security and Risk Analysis major (see http://ist.psu.edu/education/degree/bs/sra). Pitt is in a similar (and potentially stronger) position to capitalize on job growth, research funding, and increased student demand in critical areas such as these.

4. **Speed**: The world is moving too fast to delay hiring faculty in strategically important areas; Pitt cannot afford the luxury of delay. The opportunities in cybersecurity, for example, are current and urgent. Waiting two or more years to expand capabilities in this area will likely be too late, with competitors getting too far out front. There is a lot of money in cybersecurity now and Pitt is well positioned to play a significant role if it acts expeditiously. Forbes estimates the cybersecurity market will grow from $75B in 2015 to $170B in 2020, and the Cybersecurity National Action Plan calls for >$19B of federal support in the 2017 budget (https://www.whitehouse.gov/the-press-office/2016/02/09/fact-sheet-cybersecurity-national-action-plan). Board member Raheem Beyah mentioned that a 3rd year assistant professor at GaTech recently received a $17M grant in cybersecurity, which is the largest grant reportedly ever received by GaTech.

5. **Investment**: It is especially critical that the Provost's Office develop a budget that demonstrates its level of commitment to developing the SCI. This would signal to the faculty, the university, and external

constituents that this bold venture is truly a priority for Pitt. The Board also observes that substantial equity issues in faculty compensation will need to be addressed prior to the arrival of the SCI dean.

6. **Outreach**: All parties need to recognize the importance of the large community of stakeholders in the SCI (e.g., alumni, corporations, employers, high schools, students, parents, …) and make sure that appropriate levels of engagement with IA, Alumni Relations, University Communications are sustained. CS and SIS alums need to know that they are also a part of the SCI.

7. **Communication**: There will be multiple opportunities for public communication about the SCI, beginning with the Board of Trustees' approval of the proposal, through groundbreaking for One Bigelow (the hub of the Chancellor's strategic vision and the home for SCI), to ribbon-cutting and opening the doors of the new facilities that will house the School. Each of these events provides an opportunity for Pitt to raise public awareness of the university and its positive impact on society. University Communications will need a carefully constructed plan to reap the maximum reward and minimize the inevitable rumors.

8. **Advancement**: Greater support from Institutional Advancement is going to be required to raise the capital necessary for the SCI. The Board recommends assigning an experienced IA Development Officer dedicated to raising funds for the SCI as soon as the school is approved by the Board of Trustees. A full time, experienced alumni relations director for the SCI is also recommended to assure that alumni of SIS and of the CS department see the SCI as a major step forward for the University and one to which they transfer their allegiance.

ISCHOOL INCLUSION INSTITUTE (i3)

1. **Momentum**: The i3 program has achieved much in its 6 years of operation. It has also introduced some novel program elements to attract future faculty candidates, such as using PhD students from other iSchools as Teaching Fellows for i3 workshops. Over the next three years of the current (and likely final) AW Mellon grant, steps need to be taken to assure its long term continuation through diversification of financial support. Pitt could make an easy and valuable contribution to the program, for example, by making residence hall housing an in-kind contribution to the program. Up to this point, the university has charged the grant approximately $35K per year for residence hall use. Other forms of university match or in-kind contributions may also be possible. The Board also noted that some program directors at the AW Mellon Foundation have been willing to convene a meeting of other funders to advocate programs AWM has initiated but cannot sustain. Perhaps they can organize such a meeting for i3 and say, "We've built this and it is a success, now we are looking for an organization to continue it."

2. **Performance**: In its 6 years of operation, 135 students have participated in the i3 program, and 36% of those who have completed their undergraduate studies have gone on to graduate programs. Two students are currently in PhD programs. In the 2015-16 academic year, 8 research projects were submitted to peer reviewed conferences and all were accepted for publication. The full performance report is available in the Reports section of http://www.sis.pitt.edu/sisbov/documents/index.html .

3. **Sustainability**: Consider also federal sources of funding. Federal agencies that depend on employees with US citizenship and are experiencing shortages might value i3 as a supplemental recruiting vehicle. Following the BOV meeting, Chair Alfred Moyé briefly explored this possibility, particularly for Department of Defense fellowships and civilian careers opportunities. A Google search of "DoD Careers: Scholarships" produced a number of potentially interesting possibilities. UMBC, for example, has apparently been successful in attracting NSA support for ten students in their Meyerhoff Scholars program.

4. See also http://www.prweb.com/releases/2016/03/prweb13252214.htm for a $48M Fund II Foundation UNCF STEM scholars program "aimed at addressing diversity gaps."

EXPERIENTIAL LEARNING

Dmitriy Babichenko and Leona Mitchell reported on an array of student experiential learning projects which they have led. Dmitriy is building local capacity in SIS through the Learning Technologies Lab, with faculty-led projects on serious games in medicine. Leona is leading teams of students working on IT projects for the Pittsburgh Mayor's office. These are very successful endeavors that have also required substantial faculty commitment. SIS early experience with professors of practice (i.e., Dmitriy & Leona) have been very successful, but scaling up to more students is a challenge that will require more individuals like them. Currently, the School asks for no compensation from the organizations benefitting from the student projects. While the Board endorses this approach for projects benefiting public non-profit sponsors (e.g., the Mayor's office), some level of compensation should be considered for profit-oriented organizations. The Mayor's office project, for example, was estimated to have delivered the equivalent of **~$400K** worth of commercial product development (web site design). This should be factored into Pitt's calculation of **economic impact and public service** to the community. The Board noted the success of the professor of practice model in SIS and endorsed expanding this component of the faculty.

BOV 2017 and BEYOND

The SIS Board of Visitors has a very strong track record of engagement with many of the most challenging issues and opportunities that SIS has confronted as a school over the past ten years. They are also heavily invested in the planning for the new School of Computing and Information (SCI). While in a formal sense the SIS Board of Visitors will end with the opening of the new School (and, hence, this was their last formal meeting), the Board observed that their work is far from complete, and has actually taken on increased relevance and significance. **The Board has volunteered to continue through the formative stages of the SCI**, potentially augmented with additional members representing the interests of the Computer Science department.

- For the SCI to aspire to world class thought leadership, faculty hiring in key areas should proceed immediately:
  - **Cybersecurity** (a university priority, an SCI strength, and a compelling national need)
  - **Information Culture & Data Stewardship** (faculty depleted by retirements and departures, operating below critical mass in an area rich with opportunity)
  - **Data Sciences** (immediate opportunity for university-wide impact supporting a university strategic priority)

  These faculty hires will be required regardless of the choice of dean for the SCI. Recruitment should be expedited, not solely because of the need, but also to signal faculty, alumni, and the extended community that Pitt is serious about developing and supporting the new school proactively.

- SIS has proposed development of a **Cybersecurity Research Center** (CyRes) to the Office of Research (Provost Office) and is awaiting a decision regarding that proposal. The Board reviewed plans for the Center with its main author, Prof. James Joshi, and endorses it as a comprehensive, well-conceived program that serves the university's interests and aspirations in cybersecurity. **The Board recommends hiring an interim director for the proposed center and recruiting three post-doctoral fellows to launch research activities supporting its three main foci.** The Board also recommends that the operating budget for CyRes includes an explicit income line for software developed and licensed by CyRes.

- Creation of a new school by combining and realigning existing components inevitably uncovers **equity issues** among faculty in terms of compensation, teaching load, service expectations, etc. These issues need to be addressed prior to the arrival of a new dean rather than deferred and delegated to that individual.

- Support from the AW Mellon Foundation will likely stop in three years with the completion of the current **i3** grant ($850K). Now is the time to address long-term **i3 sustainability**. The Board recommends that Pitt support this excellent diversity program with an **in-kind contribution of housing** support for the i3 scholars, faculty, and staff during the summer residency programs. The Board also recommends that the i3 program sponsor in the AW Mellon Foundation be approached to work with the i3 leadership at Pitt to identify and explore funding opportunities at other foundations with whom the AW Mellon Foundation collaborates.

- For the SCI to become one of the top 10 schools of its kind in the country, it will also need to become the hub of computing and information expertise for Pitt. The Board observes that this will require an **explicit commitment of additional funding, faculty lines, and staff.** It cannot be achieved by simply combining current resources. Institutional Advancement and Alumni Relations are seen as key partners in raising the resources necessary for SCI to be the success that the University and the Board believe is vital. Their role in the capital campaign for One Bigelow is obvious, but their attention should also include SCI programmatic support (e.g., endowed scholarships and chairs). The School will also need a full-time alumni director to develop and manage existing SIS and CS alumni, as well as to engage new students to become active alumni. The Board believes that **experienced professionals in both advancement and alumni relations should be assigned to the SCI immediately following Board of Trustees approval of the new school.**