



THE UNIVERSITY OF UTAH

UI2

**INFORMATICS**

# Informatics Opportunities at the University of Utah

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**Rob A. Rutenbar** (Chair, U. Pittsburgh),  
**Annie Antón** (Ga Tech), **Ewa Deelman** (USC/ISI),  
**Joel Saltz** (Stony Brook), **Andrew Sears** (Penn State),  
**Bobby Schnabel** (UC Boulder), **Michael Zyda** (USC)

### I. Introduction

Senior VP for Academic Affairs Dan Reed assembled and charged our committee to do a broad assessment of Informatics activity across the institution. The broad outlines of the charge asked us to: examine Utah's organizational structures and resource commitments; look at opportunities in both individual areas of computing+data and in cross-disciplinary collaborations; look at the alignment of educational programs, course offerings and curricula with the rising interest in computing; examine opportunities to address diversity and inclusion in the broad Informatics arena. Our team spent two days – April 8-9, 2019 - interviewing an extensive set of key leaders and stakeholders across all these areas.

### II. Opportunities

We present here short list of observations of some suggested opportunity area across in the broad landscape of informatics at Utah.

- **Informatics is a significant opportunity for the University of Utah:** Informatics efforts are both broad and deep at Utah; this is a significant strength for the institution for any forward plans. This includes in particular the breadth of the health sciences portfolio at Utah; medicine and health are being dramatically reshaped by Big Data, so there is a timely opportunity to invest in these rising connective areas. However, the informatics opportunity is much broader than the predominantly technical units on campus. Examples: there is robust activity in business analytics; the Entertainment Arts and Engineering unit is a unique national asset for work on gamification research; the social and behavioral sciences are eager to expand their abilities to work with a rising tide of Big Data. By way of competitive differentiation, it is simply not that case that every other university is starting from Utah's level of existing informatics programming, interest, and enthusiasm.

- **Strong collaborative Informatics+X and X+Informatics hiring opportunities:** the visiting team saw significant interest in exploring novel faculty hiring options at Utah. This includes adding informatics-focused faculty to existing “X” departments, and various forms of joint, or affiliate/courtesy appointments, across two or more departments or colleges. Many of the most interesting research and teaching opportunities exist at these boundaries, and so recruiting and hiring directly “at” the boundary is a something for campus to consider. We also note that this might provide a positive and organic opportunity to check on the alignment of basic university academic policies – for example, RPT, and joint appointments – to see how well they support these sorts of non-traditional hiring modalities. Said differently – informatics might be a useful focusing lens, through which to view Utah’s fundamental policy infrastructure, and check to see if these sorts of opportunities require any tweaks.
- **Unusual Opportunity to Explore a Statistics Unit “Standup”:** We note that Utah currently lacks a formal Statistics unit, as a separate department in one of its schools, but there is interest from the Provost to create something. As data science rises to be a core component of the broad informatics domain, statistics and machine learning become core mathematical and computational enablers. Utah has the unusual opportunity to take a step back and look at the landscape of different shapes, sizes, scopes, and reporting structures for these units. Some statistics units live next to mathematics – but this is not universally true. At Carnegie Mellon, statistics is in the social sciences college. At other schools, it is next to computer science. At Cornell an entirely new Department of Statistics and Data Science (DSDS), is being located simultaneously in *three different* colleges. Utah has the opportunity to be as creative – or as traditional – as you see best fitting your needs for this critical area of statistics scholarship and teaching.
- **Entertainment Arts and Engineering is a Unique Informatics Asset:** The Entertainment Arts & Engineering Program (EAE) is a unique gem, and has routinely been rated in the top five graduate programs in Game Design as rated by the Princeton Review. The review team believes that EAE can be leveraged as part of a broader push into informatics at Utah – beyond core gaming and entertainment technologies. “Gamification” – the application of elements of game play, such as point scoring and competition with others – is likely to be at the center of many future informatics initiatives in health care, in education, and in workforce development, to name a few. EAE presents a unique partnering opportunity for others at Utah to work with experts who understand deeply the intersection of complex information domains and human users. And EAE also presents a useful model of integrating vastly disparate communities of scholarship inside a single unit, in the service of broad informatics-themed goals: computing experts, engineers, visual artists, writers, pedagogy professionals, and so on.
- **Space for a campus-wide “hub” to focus efforts on Informatics:** SCI seems to be an obvious initial contender as a focal point for a campus-level push to enhance the scale and intensity of Utah’s informatics efforts. The review committee noted that SCI already has a strong model of working across multiple departments and schools, recruiting new

cross-disciplinary faculty to focus on computational science initiatives. And the committee was particularly positive about Utah's ability to designate faculty lines to SCI to be used to cross-connect strategic research areas. An initiative might start from SCI's legacy base of STEM partners, then expand to broader partnering, e.g., across the health sciences, the social sciences, the digital humanities, etc. There are also several ancillary opportunities for a "hub" effort:

- **Discovery:** A common observation across our wide range of meetings with stakeholders was how often – given the very significant breadth of scholarship across campus -- individuals and groups working in one corner of the informatics landscape at Utah, don't know who else is working on synergistic topics on campus. Building up an ecosystem of "hub" infrastructure (e.g., website, annual review meetings, etc.) might serve as a central convening and discovery platform.
  - **Seed investment:** Campus could use this effort as a locus to offer small seed grants, architected to bring Informatics researchers and educators together to focus on campus priorities, or build new disciplinary bridges.
  - **Priorities:** Under the umbrella of a hub, the campus leadership could choose to elevate a few topical areas to be of special strategic interest, focus and investment.
- **Bioinformatics / Health Informatics as a Strategic Focus:** Continuing the previous discussion of campus priority-setting, Utah's broad portfolio of health-, medical- and bio-informatics comprises another unique constellation of assets that could be part of a strategic conversation at whole-campus level. As one concrete example, the Utah Population Database is a strikingly unique asset, and coupled with evolving -omics capacities and connections to phenotype data in electronic medical records, could be widely leveraged. The review team discussed a range of opportunities with Utah health sciences stakeholders in this area. And as a final positive note, there was strong interest from these health sciences faculty in building more bridges to the lower campus informatics assets.
  - **Many informatics-themed degree opportunities:** Informatics offers a particularly rich set of targets for novel degree experiments. "Informatics for XYZ" and "Data Science for XYZ" and "Computational XYZ" all present new opportunities for degrees – especially professional masters degrees and certificate sequences. We spoke with stakeholders about several strong, ongoing efforts, e.g., Biomedical Informatics, Nursing Informatics and Business Informatics, that seemed poised for growth. We heard of interest in a wide range of educational offerings, e.g, novel degrees spanning Biomedical Informatics, Population Health Science and lower campus informatics programs. And also interest in perhaps re-energizing existing offerings, e.g., the joint BS engineering and MBA in business might be something where an Informatics focus could be particularly popular and valuable. And, as with our observations about the logistics of cross disciplinary hiring, an informatics "surge" in new degrees might also be a useful

opportunity to look at campus tuition revenue models and how well they are aligned to resource these (often rather complicated) multiple-stakeholder degrees.

- **Center for High Performance Computing is a Unique Asset:** The review team was particularly impressed by CHPC. It is a very important resource for the Utah, one that distinguished the university in comparison to many other major research universities. The capabilities that it provides to researchers, in terms of compute power, storage, and consulting services, are very significant and are being heavily utilized, with steep growth in recent years (essentially 2x in compute hours and users just in the period 2015-18). The new opportunity – which is part of the management conversation at essentially all top, national supercomputer centers today – is how to expand support from the essential core of high-end STEM activities, to enable a rising community of data scientists and Big Data users, across non-STEM units like the social and behavioral sciences. We had a particularly useful conversation with the leadership of CSBS on this topic. They are eager to see a model for computing resources whereby small desktop prototypes of quantitative models could be more easily transitioned up to larger platforms. Because the path to HPC resources, cloud computing, parallel/distributed scale-up, is not yet part of the technical repertoire of every working quantitative social scientist, this is an opportunity for CHPC to build both training and platform capacity to serve a novel, broader community of Utah faculty.

### III. Acknowledgements

Our team would like to close with by acknowledging our gratitude to Provost Dan Read for the opportunity to visit and interact with so many highly engaged faculty and staff across the Informatics spectrum at the University of Utah, and to all of those who made time to speak with us. The logistics and organization of the meetings and schedule across both days of our visit were flawless. And the many departments, centers, units, schools and colleges that participated in this review clearly spent enormous effort in preparing their detailed pre-reads and their presentations to us. We are grateful for this thoughtful and thorough level of preparation and willingness to share ideas and aspirations, which were so critical to our visit.