15 August 2011

I have organized this information as follows: a summary of my research accomplishments; a summary of my teaching accomplishments; a summary of my service accomplishments; and organization of this subset of the promotion dossier.

My research falls broadly into four areas: requirements tracing and requirements engineering, reliability and testing, maintenance, and software engineering education.

My most successful (in terms of publication and funding) research has been in the area of requirements engineering, traceability to be more specific. I mainly collaborate with Alex Dekhtyar of CalPoly on this work. Success in this area has included: research awards (two from NASA), nine journal papers or archival publications, twenty-eight refereed conference or workshop papers, and one journal paper revision in submission. In addition, we developed the RETRO tool which is available open source through Goddard Space Flight Center's open source website. Our work has been published in very good venues – TSE, REJ, RE (7 papers in 6 RE conferences), ICSE, IEEE Software, IJSEKE, and MSR. Of special note is that we have had a journal paper accepted to each special issue opportunity available in the traceability area since we started this work (with one exception[1]).

Perhaps the most notable accomplishment with respect to this area lies in my conception and successful launching of a Center of Excellence for Software Traceability (COEST). I approached other researchers about this idea in 2006 at ICSE. By 2007, we had developed a mission, a vision, a web site, a business plan, and elected officers as well as a first draft of a set of grand challenges for traceability. Since that time, we have made datasets available, we have posted information on empirical traceability papers (akin to a body of knowledge), and have won several grants as a community. We now have a new version of the grand challenges along with research goals, evaluation criteria, technology transfer plans, and a roadmap. We have also been working on traceability infrastructure where various researchers can write components, use components written by others, and design experiments to be run against benchmarks. The COEST has been a great impetus to improved research and practice in traceability. I am a co-founder and the current (one and only) elected Director (this is <u>The</u> Director of the Center, the highest office that exists).

My testing and reliability work has not been an area of emphasis since I completed my Ph.D. and left industry, but there has been some substantial success (including funding): four journal papers and nine refereed conference and workshop papers. These have been in very good venues: Empirical Software Engineering, STVR, ISSRE, and ISSTA. My maintenance work has also been fruitful. Success has been demonstrated by three journal papers and six refereed conference or workshop papers. These have also been in good venues: JSME, ICSM, and CSMR, for example. I have also been actively conducting research on software engineering education. This has yielded one journal paper and three refereed publications in good venues (including ICSE).

[1] The paper was rejected due to a reviewer oversight. The editor agreed that the reviewer erred and the paper should be accepted to the TSE special issue but said it was "too late" and to submit it as a regular paper (the paper was later accepted by TSE as a regular paper in 2006).

My peers have also acknowledged my value by seeking me for reviewing tasks, program committees, panels, and other professional activities. I have served on Program Committees for seventeen conferences or workshops (many for multiple years) since arriving at UK, for prestigious conferences including RE and tracks of ICSE. I served on the editorial board of IEEE Software and Software Quality journal for a number of years. I have been on the editorial board of STVR since December 2006. I was added to the editorial board of EMSE this year. I have served on many NSF panels including an exclusive panel that re-designed the entire SBIR IT program. I have reviewed for TSE, IJSEKE, IEEE Software, SoSyM, Elsevier Information and Software Technology, Software Quality Journal, Journal of Software Maintenance and Evolution: Research and Practice, STVR, Empirical Software Engineering, and Communications of the ACM.

In summary, I have a total of 51 refereed conference or workshop papers (30 conference papers, 21 workshop papers), eighteen journal/archival papers, and one journal paper in re-submission. Of these, all journal papers were written after I arrived at UK and 43 of the conference/workshop papers were written after I arrived. Also, fourteen of my conference/workshop papers and seven of my journal papers have been written solely by me (or with the aid of a student).

My research funding can be summarized as follows: $2,064,200 in 18 grants (many for one year each). Alex Dekhtyar and I worked together on many of these grants, but $343,300 was funding solely for my research (no collaborator). I received $774,050 of this funding after I received tenure. My award rate is 13 of 26 or 50% for all years, and is 6 for 12 or 50% since tenure. Since tenure, I have landed three multi-year grants (prior to tenure, grants were for one year only with one exception).

With regard to teaching, I have had a heavy curriculum development load. I have been creating a software engineering curriculum for the department, developing five new courses (software engineering, requirements engineering, software design, software testing, empirical software engineering) and re-designing a sixth course (senior design project). I helped a colleague begin teaching one of the courses I developed (he has now taught it twice) as well as assisted with adding software engineering units to an undergraduate course. I have graduated two Ph.D. students (Senthil Sundaram – works at Microsoft on Bing and Ashlee Holbrook – Team Lead at Lexmark and recently declined an asst. prof. position at University of Louisville). I have four Ph.D. students who have qualified and are ABD: Wei-Keat Kong, Wenbin Li, Liming Zhao, and Bill Kidwell. I have one Ph.D. student who has passed the breadth and depth exams and will soon take the qualifier (Hakim Sultanov). I have another Ph.D. student who has passed breadth and has formed a committee and should take the depth exam this Fall (Mark Hays). In addition, I have one MS student. I have also graduated 22 M.S. students, and served on a committee of a graduated Ph.D. student and of 28 graduated M.S. students. I have received very high teaching evaluations from the students in all my classes (usually 3.8 or higher (on a scale of 0 to 4) for teaching quality and overall value of the course) as well as strong compliments on my work such as corporations contacting me for "more students like the last one we hired from your class." I also was selected as the Outstanding Teacher in Computer Science in Spring 2006.

Before moving to Service, perhaps it is prudent to make the external letter writers aware that Kentucky is an EPSCOR state that has faced and is facing economic challenges.

Many students are the first generation in their family to attend college. Our state is in dire need of jobs and of industrial development. Having come to the University after a 20+ year in industry in the Washington, DC area, I have been driven to: interact with industry to try to help create jobs (e.g., worked with Radiant Technologies in Huntsville, Alabama to help UK land work with U.S. Army Space and Missile Command), to help ready our students for industrial careers (e.g., working with industry partners on projects for the CS 499 Capstone course), and to help encourage high school students to pursue computer science as a career (e.g., visiting high schools in economically disadvantaged areas of Kentucky to explain the benefits of a career in computer science).

Moving to service at the University, I served a three year term on the Faculty Senate. I assisted with the first accreditation undertaking of the department as well as the re-accreditation a few years following that (to be in line with the accreditation schedule of other departments in the College). I serve on the Industry Advisory Board for the department and am responsible for high school visits as part of our undergraduate recruiting process. I serve on the undergraduate curriculum committee. I assist the graduate admissions committee, as requested. I work with the Society of Women Engineers on such projects as Girls Enjoying Math and Science (GEMS). I performed out-briefing of coop students for the College. I have undertaken a number of software projects, as part of my teaching, to assist medical researchers at UK. I also develop short courses and teach Kentucky K-12 teachers and administrators each year at the Kentucky Teaching and Learning Conference (KTLC).

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