



INSTITUTE FOR SOFTWARE RESEARCH

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Student Volunteers Organizers
ICSE 2012

RE: Application of Yongjie Zheng

Yongjie Zheng became my Ph.D student upon his entrance to UC Irvine in the fall of 2007. I have continued as his primary advisor since, and I expect that he will graduate this coming June. Over these past few years I have come to really admire and respect Yongjie. He is remarkably deep and has become a very effective communicator. He is headed for a research career, and this year represents his last chance to serve as an ICSE Student Volunteer. He has a paper in the main research track and is eager to make contacts with those who will be his research peers over the coming years. The SV program is an excellent venue for that.

The particular open problem that Yongjie has addressed in his dissertation work is supporting architecture-based system implementation by supporting consistent (co-)development of architecture and source code. As Yongjie's papers point out, the pre-existing work in this field takes on one of two primary flavors: either you avoid inconsistency between architecture and source code by wholly generating all source code from architecture specifications ("correct by construction") or some form of "round trip engineering," in which effort is made to adjust the architecture specs to keep them consistent with evolving code. Correct-by-construction is great when you can do it, but relatively few domains currently allow such an approach to succeed. Round-trip engineering is based on exploiting traceability between elements of the architecture and parts of the code. Knowing correspondences helps assessment of whether elements are consistent; a further requirement is to fix things up when they have become inconsistent.

Yongjie's solution, 1.x-way mapping (a name admittedly that does not trip off the tongue with ease!) takes elements from both approaches, and improves the situation in a couple of ways. Generation is used as part of the solution, yet manual programming as well. The key is keeping the two in sync and in their proper sphere of authority. This is done by requiring that changes that require modification to the architecture be done at the architecture level, and changes that are below the level of architecture are performed in such a way that they cannot mistakenly alter the architecture. Life gets interesting, of course, when the "spheres of authority collide" and changes have to be coordinated across the levels. Architecture specifications, a change model, change notification, and code regeneration all end up being involved in the solution, as described in Yongjie's most recent paper, "Enhancing Architecture-Implementation Conformance with Change Management and Support for Behavioral Mapping." This paper was recently accepted to the ICSE 2012 research track.

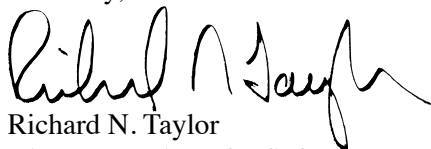
Whatever directions Yongjie takes in his research career, I am very confident that his work will be based on a very thorough, and very extensive study of all the relevant literature. He has been truly exemplary in his dissertation work in digging down into the details of a very extensive set of related work. I think that reflects very positively on his diligence, work ethic, and commitment to excellence. And of course those are all characteristics of a good ICSE Student Volunteer!

Yongjie has also demonstrated excellence in teaching, and teaching-related activities. He served as a teaching assistant for me a couple of times, as well as for other professors. I have heard only positive comments regarding his work with students. This doesn't surprise me: he takes time with individuals and makes sure that issues are resolved.

Related to teaching ability is Yongjie's ability to communicate effectively in both written and spoken English. When he first came to UC Irvine in 2007 his English was OK, but in the past several years he has improved to the point where it is really outstanding. It is a very rare occasion when I have to point out any type of issue. His writings are well-organized and effectively communicate his material.

On the personal level Yongjie is very pleasant and easy to get along with. He has been a well-liked member of my research group and a member of the graduate student community at Irvine. His commitment to succeed and willingness to engage the hard tasks give me assurance of his future success. He is very smart; he is highly organized. He has my unreserved strong recommendation. Please feel free to contact me if you have any further questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'Richard N. Taylor', with a stylized, flowing script.

Richard N. Taylor

Director, Institute for Software Research

Chancellor's Professor of Information and Computer Sciences