

# CS(~~4GD~~) should look like CS not do-goodery

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## 1. INTRODUCTION

**Why?:** Why should Computer Science for Global Development (CS4GD) be focused on Computer Science and not on achieving the goal of global development? This is an intentionally controversial and exclusionary statement. After all, most of us with interest in this area are motivated by the desire to improve the world. We have valued collaborators in Sociology, and indeed many of the most important problems in global development are sociology or economics problems, not technology problems. So why should we be CS centric? Shouldn't we embrace interdisciplinary work and directly adopt the language of global development? I believe there are two good reasons why we should be CS centric: effectiveness and pragmatism.

**Effectiveness:** Technology is effective at solving problems, and technology has a clear history of progress. Cell phones have done more to provide communication and employment opportunities to the poor than any intentional development program. The internet and search engines have done more to increase access to information globally than any intentional library project. Both arose from the advances made in technology research. These advances were not an accident. Technological progress is the result of a well oiled joint government, academic, and industrial machine. Unfortunately, the application to development in both of these examples was an "accident". Our goal should be to more systematically channel CS research towards development, even targeting our research in this direction. But make no mistake, to be effective, we should be working on computer science, not on development.

**Pragmatism:** There are purely pragmatic reasons to focus on computer science research. The most important is that groups in CS departments *must* function like CS. We need to fund graduate students, faculty summer salary, and large equipment budgets. Our funders expect us to be working on CS. We also need to get buy in from other parts of computer science. Our colleagues sit on dissertation and tenure committees and its important that we are speaking their language. HCI practitioners have suffered dearly because many departments can not come to an agreement that HCI is indeed a part of CS. Within CS4GD people

have turned down faculty positions in part because its not clear they can be tenured, and I myself am not 100% convinced its responsible to take impressionable young Ph.D. students in an area for which I can neither fund them reliably nor convincingly argue the topic is actually CS. Our work is by its nature interdisciplinary enough, we should be trying as hard as we can to make it appear *not* interdisciplinary, fitting squarely in CS.

## 2. ACTIONS

**Branding:** We need a good brand. Computer Science for Global Development *sounds* like an application area. We might as well work on CS for Literature Studies or CS for Art Practice. To be accepted we need to be a *core* CS area. It is not by coincidence that departments don't hire anyone in the area of CS for Biology... but Bio-infomatics, well now, that's a hot CS topic. Unfortunately I can't come up with a good name that gives the connotation of computing for a future of nearly everyone, instead of the minority of elite that are the current targets. "Bottom Billion Computing" isn't right – I don't like the word "bottom", since it connotes charity and not opportunity and growth. "Global Computing" is a maybe, but doesn't seem right. "ICT4D" has the same problems as CS4GD and is already quite tied up with sociologists and development experts, so adopting it will create name space conflicts. We lack a good name now, we need one, its crucial to our efforts, and the choice is important because the words chosen will influence which topics are included and which are excluded from this new area.

**Definitions of good research:** We should define the quality of our research in ways that are as similar as possible to other areas of CS. I believe orderability and impact are two good criteria.

*Orderability* is what makes it possible to discuss whether one set of work is "better" than the prior art. Nearly all of CS is quantifiable in some way and it is possible to know that a new solution is 20% better than a prior solution. I believe this is critical to the rapid rate of progress in technology research. As an example, I do not prefer research that concludes that kiosks do or don't work in a particular case study. I much prefer a conclusion that they

would be viable if the computer cost \$X. In this case X is quantifiable and the next paper is challenged to compare their findings to the prior work in a direct way. It is not important that we agree on the metrics used to make quantifiable claims, this will be impossible. Neither is it important that the metrics are perfect, they won't be. However it is important that we are in the habit of making direct comparisons, and are not afraid to argue that our new work is "better" and thus someone else's prior work is "worse".

*Impact* should be measured in the long term. We shouldn't allow our work to become about the *direct* impact on lives that we may or may not have. Research is not better simply because it serves 10,000 people instead of 10. Of course it may be necessary to validate against populations of some size in order to be credible, but this is not the same as having a direct goal of serving the population. By analogy, if we invent a new memory architecture, it is not important that the researchers themselves start a company and commercialize this work. They don't even need to fabricate a real chip. If a paper design leads to new understanding that allows someone else to ship millions of units, that's still impact. *Indirect* impact counts.

**Marketing:** As with any startup endeavor, proper administration and marketing are crucial.

*Create ACM Transactions on [CS4GD].* It is important that this is ACM, since this stamps it as computer science. It is important that it's part of the Transactions journal series since this stamps it as serious work. Regular publication in ACM Transactions on X is by definition good enough to satisfy any computer science dissertation or tenure committee.

*Get NSF CISE to include [CS4GD].* This field should explicitly have a home somewhere buried in the hierarchy of IIS/CCF/CNS, in the same way that computer vision, or database systems has a home. When NSF says its real, then

it becomes a grant target. This is critical since only the large and relatively stable funding of NSF can provide for sustained employment of graduate students. I believe the justification with regard to NSF is not "We have a duty to help poor people," but rather "The US has 5% of the world population, if we want our companies and economy to grow, we need to be the innovators in serving all these new consumers. We have to do this, its in our national interest."

*Make it safe for junior faculty to declare this is their research area.* I chose my institution intentionally as one which I perceived to have a campus culture that would be accepting of this area. Even so, I was heavily advised against entering this area pre-tenure and was too risk adverse to ignore that advice.

*Implement consistent branding across universities.* We should adopt the same brand, rather than some of us doing 'technology for social issues', some 'ICTD' and some 'CS4GD.' A good goal would be to get at least one faculty in 5 of the top 10 CS departments to list the brand as one of their primary research areas. This should be sufficient to bring everyone else along. A consistent brand will go a long way towards making this a "core" research area in CS.

### 3. CONCLUSION

This has not been intended as an argument that we shouldn't collaborate. Indeed, I believe we should. This is an argument that there is value to creating a CS centric identity that has meaning even in the absence of true collaborative interdisciplinarity. Further, its not just valuable, it's a practical necessary precondition to being accepted as CS research, and thus allowing faculty to run labs full of graduate students who spend full time working in the area.