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# Position Statement for ‘Workshop: Moving Transparent Statistics Forward’ at CHI 2017

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## Background

I am a PhD candidate at the Media Computing Group in RWTH Aachen University, Germany. I study interfaces that help users learn statistical analysis. My vision is to improve statistical literacy through technology. My current project is titled StatPlayground. StatPlayground is an interactive app that allows users to directly manipulate data properties (e.g., mean, standard deviation, shape of the distribution) through visualizations and see the effect on both the other properties and, more importantly, the results of statistical analysis (e.g., p value, effect size). StatPlayground is a work-in-progress and could potentially improve the statistical literacy skills of the user. It has been handed in as a Demo: Interactivity submission for CHI '17.

Earlier, I authored a Student Research Competition abstract at CHI '14 [2] and coauthored a full paper at CHI '15 [3] both about Statsplorer. Statsplorer is a visualization-driven interactive tool that allows novices to perform statistical analysis without much prerequisite knowledge. The tool automatically checks the statistical assumptions and performs the appropriate test. A user study showed that Statsplorer helps users in forming knowledge scaffolds that were beneficial when the students took a statistical lecture later on. Both StatPlayground and Statsplorer are motivated by issues in statistical practice in HCI.

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Statsplorer and StatPlayground both use null-hypothesis significance testing (hereafter abbreviated as NHST). Working on these projects required me to understand the underlying concepts of NHST. In addition to NHST, I am also familiar with the 'new statistics' [1] – the use of effect sizes and confidence intervals. I teach NHST and new statistics as a part of an introductory HCI research methods course. I have also used these methods in practice in e.g., developing Statsplorer and StatPlayground, analyzing experimental data, an online course<sup>1</sup>. I also have a working knowledge of Bayesian inference, but I have neither applied it in practice nor taught them to students.

### Areas of Interest

I have a Master's degree in Computer Science. I have been a teaching assistant for an introductory HCI course<sup>2</sup> for the past three years. Although I do not have a formal education in statistical analysis, I feel I have adequate knowledge drawn from my research projects to make worthy contributions to this workshop.

### My Stance

In my opinion, what the Transparent Statistics initiative asks of a HCI researcher is quite fundamental: *openness* and *plain truth*. I strongly believe that several issues that plague statistical practice in HCI can be overcome by making statistical reporting transparent.

I find the task of providing incentives to the authors for adopting the proposed statistical practice rather interesting. I like the idea of using badges to achieve this as an extrinsic motivation for the authors. But the approach that would work long-term is to help the researchers see for

themselves the benefits of such an adoption. (Although I suspect this is not viable in a short period of time.)

Given my experience with Statsplorer and my interests, I am interested in contributing towards two documents: resources aimed at authors and the main proposal document. In the main proposal document, I am interested in working on incentives for the authors.

I find this to be an opportunity to make tangible changes to the HCI community. This workshop could shape the statistical practice in HCI (and possibly other fields) for years to come and this excites me!

I find the Transparent Statistics community fascinating. I have already started browsing through the discussion on the mailing list and the draft documents on Google Drive. I look forward to contributing at the workshop!

### References

- [1] Geoff Cumming. 2013. *Understanding the New Statistics: Effect Sizes, Confidence Intervals, and Meta-Analysis*. Routledge.
- [2] Krishna Subramanian. 2014. VisiStat: Visualization-Driven, Interactive Statistical Analysis. In *CHI'14*. ACM, 987–992.
- [3] Chat Wacharamanotham, Krishna Subramanian, Sarah Theres Völkel, and Jan Borchers. 2015. Statsplorer: Guiding Novices in Statistical Analysis. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*. ACM, 2693–2702.

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<sup>1</sup><https://www.coursera.org/account/accomplishments/certificate/XALDUYD6Y47K>

<sup>2</sup><http://hci.rwth-aachen.de/dis>