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# How do Design and Evaluation Interrelate in Human-Computer Interaction (HCI) Research?

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## INTRODUCTION

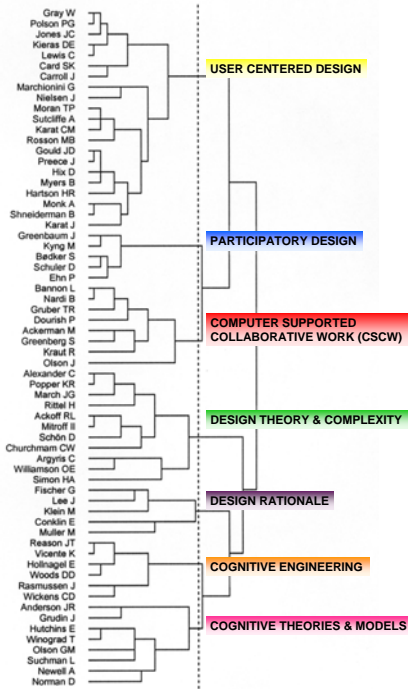
Human-Computer Interaction (HCI) is defined as “a discipline concerned with the design, evaluation, and implementation of interactive computing systems for human use and with the study of the major phenomenon surrounding them” [2]. *Design* and *evaluation* are two very important words in this definition. In HCI there are authors that focus more on designing for usability and there are authors that focus more on evaluating usability. The relationship between these communities is not really clear. While many (e.g., [1, 3, 4]) have argued that *design* and *evaluation* are closely related, they are typically separated in practice. Design and evaluation both share the common goal of usability but each takes a different path in trying to achieve it, we question this approach. We use author cocitation analysis, multivariate techniques, and visualization tools to explore the relationships between these communities.

## AUTHOR COCITATION ANALYSIS

Author cocitation analysis (ACA) focuses on cited authors' bodies of work (*oeuvres*) [5, 6, 7, 9]. ACA is concerned with the frequency with which pairs of authors' names co-occur in reference lists. ACA allows the unseen structures and relationships in the literature as seen by citing authors to emerge.

## Cluster Analysis

The results of the hierarchical cluster analysis as a dendrogram are seen below. All hierarchical agglomerative cluster analyses begin with a set of individual objects and, step by step, join objects and clusters until a single cluster is achieved.

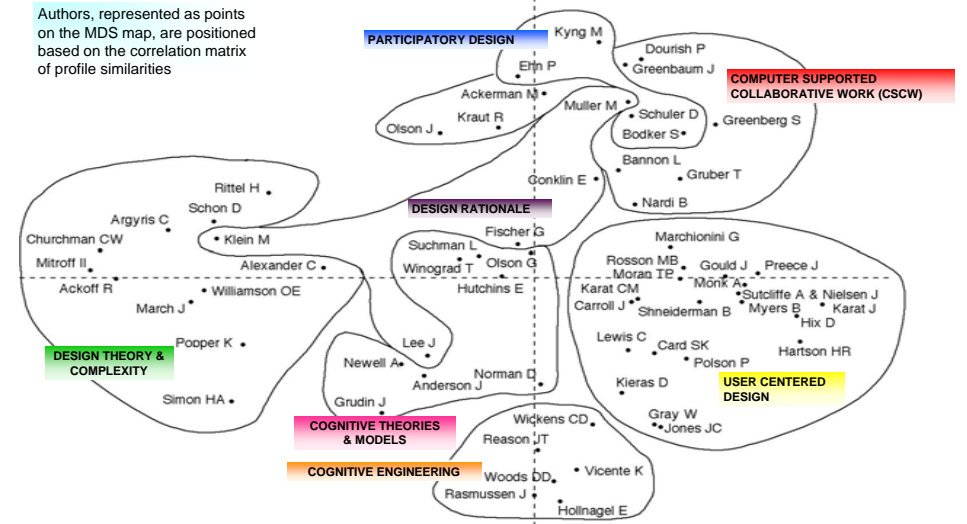


Authors clustered together generally have an identifiable link based on the subject matter of their writings, their geographic or institutional affiliation, school of thought, or other intellectual connection

Cluster Analysis

## Multi-Dimensional Scaling (MDS)

A two-dimensional multidimensional scaling (MDS) map is shown below. The seven clusters identified in the cluster analysis are added to enhance the map. In MDS R Square and stress are indicators of the overall “goodness of fit.” The R Square is the proportion of variance explained. The stress is the distortion or noise in the analysis. When the authors are mapped in a two dimensional map, as seen here, the R square = .89485 and stress = .15254 (Young's S-stress formula 1 is used).



Author Cocitation Analysis of HCI authors, 1990-2004

## CONCLUSIONS AND FUTURE WORK

The field of HCI began by combining theories and practices from other disciplines and has, over time, generated its own specialty areas. The author cocitation analysis reveals the specialty areas that, collectively, comprise the HCI field. Overall, the analysis of the literature shows clusters of authors corresponding to seven distinct viewpoints within HCI. We intend to further analyze these findings by using Pathfinder Network (PFNet) analysis to provide another viewpoint of the author cocitation data. PFNets can identify dominating authors and point to specialties within a discipline [8].

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