

12th ICCRTS

“Adapting C2 to the 21st Century”

Scientific and graphic design foundations for C2 information displays

C2 Concepts, Theory and Policy, Cognitive and Social Issues, C2 Metrics and Assessment

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Abstract

Whether designing from scratch or modifying an existing command and control (C2) information displays one should always take into account the vast amount of background research that has been performed in both the psychological as well as the graphical design literature. The literature describes empirically tested principles and theories on how humans perceive and organizes information. However, surveying this vast literature can be daunting as well as overwhelming if one's background is not in the applied science (e.g., psychology and information visualization). We will give a review of the most relevant issues in the literature as well as how the findings may be applied. For example, for graphical and information visualization design we discuss the work of authors such as Tufte, Ware and Healy and how their approaches help one to better design graphical interfaces and advanced visualizations. Likewise, a review of the psychological literature will discuss issues such as attentional capacity issues (e.g., attentional capture, change blindness) and memory issues (short versus long term versus working memory) among others. We end by discussing a proposed method for taking into account and applying these principles for the design of an optimal C2 information display system.

Outline

- 1) Introduction
 - a. What are the domains of interest and why?
 - i. Graphical Design
 - ii. Psychology
- 2) Graphical Design
 - a. Overview
 - b. Tufte
 - c. Ware
 - d. Healy
 - e. Others
- 3) Psychology
 - a. Vision science
 - i. Capacity issues
 - ii. Design issues
 - iii. Attentional issues
 - b. Memory and cognition and decision making
 - i. Types of memory
 1. encoding
 2. decoding
 3. remembering and forgetting
 - ii. Cognition and decision making
 1. do we make good decisions?
 - a. Why or why not?
- 4) How to apply the findings.