A sequence analysis of actions in complex system comprehension

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Abstract: Complex systems have a broad network of relations for which human comprehension is severely limited and analysts often rely on the support of technological systems. In this study we investigated whether comprehension can be augmented by IMAGE – a set of interactive visualization, data exploration and knowledge representation tools – and explore behavioural signatures associated with the optimal use of IMAGE. The comprehension and use of IMAGE of 24 participants were examined in the context of a scenario involving military convoys evolving their strategy according to the reactions of a hostile and dynamic environment. Comprehension was measured by a score normalized in function of a randomly generated exploration of the system. A sequence analysis was performed to extract the pattern of IMAGE-user interaction. Our results reveal a great diversity across participants and that transitional probability of key IMAGE events is not related to augmented comprehension in a simple structured way.