Novel Methods in the Visualization of Transitional Phenomena

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ABSTRACT

Transitional data, whether within the framework of Markov Chains where the transitions are modeled as moving from state A to state B or within the context of Survival Analysis where a subject experiences the passage of time before an event occurs, can be used to model various phenomena. The initial concept for the visualization of this data is quite easy to grasp given rudimentary knowledge of matrices and standard computer programming functions such as sort and image available in many programming languages and packages. Research on the effects of sleep apnea on sleep architecture has largely been limited to time collapsed measurements. Fifty-nine apneics and non-apneics from the Sleep Heart Health Study were matched on factors including age, gender, race, and BMI. Using the concept of sorting and imaging a matrices containing transitional sleep data revealed potential differences in sleep architecture between apneics and non-apneics whereas time-collapsed summaries obscured these differences. The concept of sorting and imaging a matrix containing transitional data is quite useful in the exploration and investigation of transitional phenomena and provide an impetus for models that account for transitional and temporal domains.