école normale supérieure paris—saclay

ENS-IISER Network | BIOSANTEXC Project
Internship Proposal Form

To be sent back to ri-incoming@ens-paris-saclay.fr by February, 2nd 2024
All fields are required

The subject is related to interdisciplinary life sciences (BIOSANTEXC) Yes
Field: Computer Science

Internship title: **Exploratory Analysis of Dream Narratives**

Keywords related with the subject (minimum 3): Quantitative Dream Analysis, Data Visualization, Social Sciences.

Name of the laboratory at ENS Paris-Saclay: Laboratoire de Méthodes Formelles- **the Formal Methods Laboratory**

Name of the internship supervisor(s): Alain Finkel

Email(s) of the supervisor(s): alain.finkel@ens-paris-saclay.fr

Requested level: Master 1 or Master 2

Prerequisites for the internship: Computer Science with a focus on Data Analysis, Data Analysis (>50h), Data Visualization (>10h), Programming with Python (>30h), Natural Language Processing is a plus

Foreseen dates approximately (3 months max – May to July): 01/05/2024-15/07/2024

Internship proposal (description and expected training outcomes / half page min, 1 page max) (mandatory): The Hall & Van de Castle annotation scheme is used to analyze and categorize the content of dream narratives. This scheme classifies different elements of dream narratives, such as characters, emotions, interactions, objects, and locations. The annotation guideline is available at https://dreams.ucsc.edu/Coding. In an upcoming article, we have automated the coding of characters and their emotions in dream narratives using language models. More than 27,000 dreams, coming from the DreamBank database of dream narratives (http://www.dreambank.net) [1], have been automatically annotated.

In this internship, we would like to perform an exploratory analysis of these annotations. Firstly, the intern will need to familiarize themselves with the structure of the DreamBank database and understand the Hall & Van de Castle annotation scheme. Then, they will conduct a bibliographic research on dream analysis from various perspectives (psychological, sociological, etc.). Indeed, DreamBank contains a multitude of different dreamer profiles, such as visually impaired individuals or people who experience lucid dreams (http://www.dreambank.net/grid.cgi). We want to compare the annotations produced by our model with observations from other disciplines, such as psychology or sociology. For example, what do we know about the dreams of visually impaired people [2] or individuals suffering from post-traumatic stress [3]? Can our

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annotations shed light on certain observations from other disciplines?

To answer this last question, the intern will perform an exploratory analysis of the annotations of our model. The goal will be to visualize the annotations as effectively as possible, according to various criteria to be defined (e.g., psychological profile, gender, age, etc.). Then, they will compare our observations with certain observations from other disciplines.

Finally, the intern will develop a typology of the errors of our model. This will involve comparing the annotations of our model with gold-standard annotations. What are the different types of errors that the model makes, and how can they be remedied?

The intern should be comfortable with data analysis, particularly data visualization. They should have an interest in social sciences. Knowledge of certain methods in natural language processing is a plus.

[1] Domhoff, G. W., & Schneider, A. (2008). Studying dream content using the archive and search engine on DreamBank.net. Consciousness and Cognition, 17(4), 1238-1247. https://doi.org/10.1016/j.concog.2008.06.010
[2] Kang, J., Bertani, R., Raheel, K., Soteriou, M., Rosenzweig, J., Valentin, A., Goadsby, P. J., Tahmasian, M., Moran, R., Ilic, K., Ockelford, A., & Rosenzweig, I. (2023). Mental Imagery in Dreams of Congenitally Blind People. Brain Sciences, 13(10), Article 10. https://doi.org/10.3390/brainsci13101394
[3] Barrett, D. (2002). The « royal road » becomes a shrewd shortcut : The use of dreams in focused treatment. Journal of Cognitive Psychotherapy, 16(1), 55-64. https://doi.org/10.1891/jcop.16.1.55.63701