

## Don't do it: Social Web Mining for suicide prevention

**Description.** Suicide is the deliberate act of ending his own life. Suicide reveals serious personal problems but also often reflect a deterioration of the social context in which an individual lives. Risk factors are multiple and complex (changes in personal relationships, harassment, addiction, unemployment, clinical depression and other forms of mental illness, etc.). According to a very recent and alarming WHO report<sup>1</sup> (September 4, 2014), **one person commits suicide every 40 seconds** - more than all the yearly victims of wars and natural disaster. The number of suicides in the world in 2012 is estimated at 804,000, which represents an age-standardized rate of suicide to 11.4 per 100 000 (15 males and 8 females). Europe is far from being spared with an age-standardized suicide rate of 12 per 100,000 inhabitants in 2012 (20 years for men and 4.9 for women). The highest suicide rates are measured in the Baltics and Central Europe (Estonia, Hungary, Latvia, Lithuania and Slovenia, with more than 17 deaths per 100,000 inhabitants). The majority of people who commit suicide are men, by a ratio of two compare to women, as they tend to use less effective methods. Suicide is also related to age. People under the age of 25 and over 50 are particularly at risk. Most suicide attempts are supported by hospital ER. Suicide is a major public health with strong socio-economic consequences. As part of the Action Plan for the 2013-2020 Mental Health, WHO Member States have pledged to meet the global target of 10% reduction in suicide rates all over the world by 2020.

The main objective of this thesis is to develop new technologies for early identification of at-risk individuals through their use of the social web. S. Bringay and J. Azé (supervisors) have already developed an initial prototype based on a predictive model, which has proven to be effective for identifying at-risk people through their publications on the Twitter social network. In this thesis, we extend the problem to other media (blogs, forums, social-Facebook, email, instant messaging, etc.) and focus on two scenarios: 1) the semi-automatic detection model of suicidal profiles will be used by psychiatrists, to monitor patients on the Facebook or Twitter network, who have stayed in their service after a first suicide attempt. We intend to capture a possible deterioration in their mental state in order to offer them assistance when needed. The aim is to prevent suicide recurrence; 2) the semi-automatic detection model of suicidal profiles will be used by organizations as *Arrêt Demandé International*<sup>2</sup> receiving contacts via instant messaging and emails to help them prioritize their responses.

The work of the PhD student will focus on three major challenges: 1) use methods of **information retrieval** to collect heterogeneous texts issued from the social web and dealing with topics associated with suicide (depression, anorexia, etc.). These data will be stored in a texts warehouse, robust to the characteristics of the data (heterogeneity, large volumes, velocity, etc.); 2) tag at-risk messages with a new typology involving various risk factors and use these marks to mine the messages and detect at-risk people. The objective is to obtain a predictive model to effectively trigger graduated answers; 3) instantiation of model for the two scenarios previously identified.

**Institutions:** University of Montpellier 2, LIRMM (*Laboratory of Informatics, Robotics, and Microelectronics in Montpellier*).

**Supervisors:** Jérôme Azé [Jerome.Aze@lirmm.fr](mailto:Jerome.Aze@lirmm.fr) and Sandra Bringay [Sandra.Bringay@lirmm.fr](mailto:Sandra.Bringay@lirmm.fr)

**How to Apply:** For additional information about the position, please contact PhD. candidate Juan Antonio LOSSIO-VENTURA, [juan.lossio@lirmm.fr](mailto:juan.lossio@lirmm.fr). An ideal candidate must be from Peru (**mandatory**), should have a Master's degree (**not mandatory**) in computer science or mathematics. Also those who are expected to finish their Master's degree may apply. Good programming skills (e.g. Matlab, Java,

---

<sup>1</sup> [http://www.who.int/mental\\_health/suicide-prevention/world\\_report\\_2014/en/](http://www.who.int/mental_health/suicide-prevention/world_report_2014/en/)

<sup>2</sup> <http://arretdemande.org/en/>

C++) and fluency in spoken and written English and/or French are required. The starting date is negotiable.

**Application Deadline:** The application deadline is November 5, 2014.