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-- PhD position - L3i - La Rochelle France

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Title : Extraction of complex textual elements – Application to onomatopoeia detection and recognition in comics books

The L3i laboratory has one open PhD position in computer science, in the specific field of document image analysis and pattern recognition

Duration: 36 months
Position available from: June 1st, 2019
Salary: approximately 1200 € / month (net)
Place: L3i lab, University of La Rochelle, France
**Specialty**: Computer Science/ Image Processing/ Document Analysis/ Pattern Recognition
Contact: Jean-Christophe BURIE (jcburie [at] univ-lr.fr)
**Position Description**
The L3i is a research lab of the University of La Rochelle. La Rochelle is a city in the south west of France on the Atlantic coast and is one of the most attractive and dynamic cities in France. The L3i works since several years on document analysis and has developed a well-known expertise in 'Bande dessinée", manga and comics analysis, indexing and understanding.
The work done by the post-doc will take part in the context of the **SAiL** (Sequential Art Image Laboratory) a joint laboratory involving L3i and a private company. The objective is to create innovative tools to index and interact with digital comics.

Comics are a combination of textual and graphic information. The textual elements mainly appear in speech balloons and correspond to the dialogues between the characters (heroes) of the story. However textual information also appear in the panels, drowned among the graphic elements in the middle of the action as shown in the figures below.
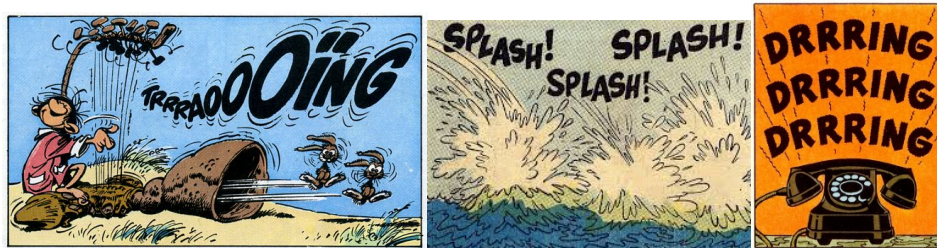
Samples of onomatopoeia in Franco-Belgium Bandes Dessinées
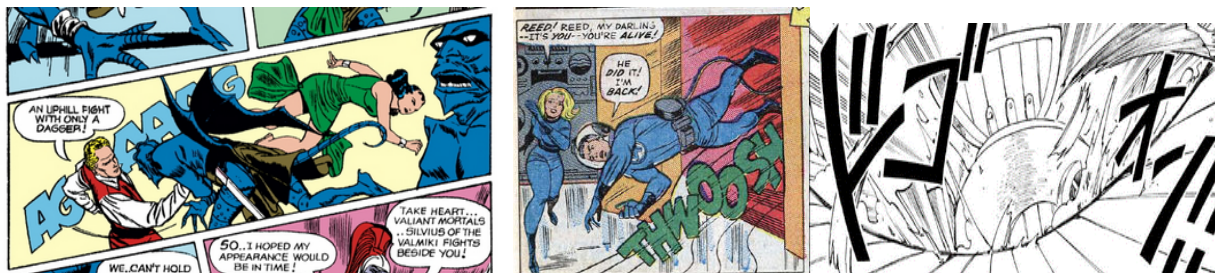
Samples of onomatopoeia in American comics and Japanese manga

Theses textual elements are called onomatopoeia. An onomatopoeia is a word that phonetically imitates, resembles, or suggests the sound that it describes. For example, "meow" and "roar" correspond respectively to the noise of a cat and a lion. Japanese manga always include also many onomatopoeia that are not just imitative of sounds but cover a much wider range of meanings. So, detecting and recognizing the onomatopoeia can help to understand the content of a panel.

The research topic of this thesis will consist in developing strategies to detect, extract and recognize the onomatopoeia, which own variable characteristics in terms of shape, colour and orientation. The main difficulty is that there are many different style of onomatopoeia. Some of them correspond to text mixed with graphic as shown in the following image.

Samples of onomatopoeia mixing text and graphic

The objective of the work will be to propose original and robust approaches to detect and recognize these complex textual elements in different type of comics books.

Qualification
Candidates must have a completed Master's degree in Computer Science with good knowledge in image processing, image analysis and pattern recognition. Some knowledge in machine learning and deep learning will be appreciated.

General Qualifications
• Good programming skills mastering at least one programming language like Java, Python, C/C++
• Good teamwork skills
• Good writing skills and proficiency in written and spoken English or French

Applications
Candidates should send a CV and a motivation letter to jcburie [at] univ-lr.fr.