$\mathcal{K}$: activity report 2019

Team $\mathcal{K}$, LORIA

The team $\mathcal{K}$ is described at `https://k.loria.fr/`, with a link on the publications of the members of $\mathcal{K}$. This document describes briefly the 2019's events of the team, in particular its publications.

1 Creation of the team and composition

$\mathcal{K}$ was created in February 2019, with Aurélie Bannay (PHU), Nicolas Jay (PUPH), Jean Lieber (MCF HDR, coordinator), Emmanuel Nauer (MCF) and Michaël Schnell (PhD student). Nicolas Lasolle has started his PhD in september 2019 in $\mathcal{K}$ and in the AHP-PReST laboratory.[1] Aurélie Bannay has spent 6 months in University of Rennes 1. She was hosted as visiting researcher by a team specialized in using big data for healthcare (team *Données massives en santé* of the LTSI, *Laboratoire Traitement du Signal et de l'Image*).

2 New results

Contributions to case-based reasoning (CBR)

The paper [4] is related to an approach to CBR based on analogies, called analogical extrapolation and based on the idea that if four problems are in analogy then it is plausibly inferred that their solutions are also in analogy. More precisely, this paper introduces a notion of case pair competence to improve analogical extrapolation. The paper [3] is a French version of this paper.

In [2], analogy is used in CBR for the purpose of local enrichment of the case base "around" the target problem. The cases enriching the case base are penalized cases, i.e., cases that are uncertain. Then, the principle of application of this idea to the issue of case-based machine translation is studied (for formal languages and natural languages).

In [6], the evaluation of a CBR system is carried out. This system aims at assisting coders, whose task consists in coding medical cases in the field of oncology.

Contributions in healthcare

The article [5] is a literature review and a position paper about the potential benefits of Big Data in the management of Inflammatory Bowel Diseases (IBD). We present several big data strategies aimed at improving diagnosis, understanding, treatment and prognosis of IBD.

In [1], we assessed the diagnosis and prognosis value of plasma volume status for the management of dyspnea in emergency units.

3 Projects and cooperations

OLKi project

The OLKi (Open Language and Knowledge for citizens) project[2] gathers several research projects which use artificial intelligence as a response to scientific and social issues. One of the main objectives is to develop a social platform to connect researchers, scientists and citizens. As part of this project, a thesis is conducted in cooperation with the AHP-PReST laboratory. It aims at proposing new methods for an efficient annotation and exploration of the Henri Poincaré correspondence corpus. Composed of around

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[1] `http://poincare.univ-lorraine.fr/`
[2] http://lue.univ-lorraine.fr/fr/open-language-and-knowledge-citizens-olki

2100 letters sent and received by this famous scientist, it is a great source of information for the historians of science. The developed methods use Semantic Web and can be applied for other corpora.

Cooperations around case-based reasoning

Two cooperations around cased-based reasoning and mainly focused on analogy are effective: one with Henri Prade, IRIT, Université de Toulouse, France and one with Yves Lepage, Waseda University, Japan.

References

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