WT2.17: Information Technologies Institute, Thessaloniki, Greece

Report

Activities performed during the visit

in   ITI Thessaloniki

period: 16-08-2016 -18-08-2016

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The main building of ITI

Personal Information

Mr. Jerzy Sas , faculty member of member of Wroclaw University of Technology, faculty of Computer Science and Management, Poland visited Information Technologies Institute, Thessaloniki, Greece in the period from 16-08-2105 to 18-09-2015 in order to make agreements concerning final stage of collaboration in the field of image analysis and understanding, in particular: a) to review and compare results of works carried out at ITI CERTH and WrUT during the period 10.2015 – 06.2016 related to patent image segmentation and b) to outline plans of works on integration of segmentation methods elaborated and initially tested by collaborating parties.

Information about Seminars

N/A

Description of scientific activities

The aim of the visit was to shortly review results of collaboration achieved since the last visit in September 2016 and to discuss the possibilities of comparison and integration of image segmentation methods developed recently in WrUT and ITI CERTH.

The following researchers participated in the consultations:

- Anastasia Moumtzidou – the main researcher and developer involved in the project,
- Stafanos Vrochidis – supervisor,

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- Ilias Gialampoukidis – a researcher with expertise in clustering methods who elaborated and implemented image segmentation methods in ITI,
- Jerzy Sas – the main researcher in WrUT involved in the collaboration who elaborated, implemented and tested image segmentation method developed in WrUT.

The following particular topics were discussed in the course of consultations:

- ITI researchers analyzed and explained the reasons of community detection methods failure observed in the case of its adaptation trial to patent figures (this method was selected as the candidate concept of figure segmentation experiments in ITI during the previous visit).
- Ilias shortly described some details of DBSCAN method adapted to figures segmentation, which was selected as the next candidate to evaluation after the failure of community detection trials.
- Typical segmentation errors observed in case of DBSCAN methods were considered.
- Rough ideas of fusing caption-based segmentation with DBSCAN method adapted to images were discussed.
- Other segmentation assessment methods alternate to F1-based assessment used in already carried out experiments were proposed by ITI researchers.
- Rough work plan related to final comparison and fusing of methods elaborated and tested by both parties was outlined.
- The work schedule of final common article summarizing all works carried out in the course of ENGINE project was sketched out.

During the period since the last visit to ITI-CERTH, the works of patent image segmentation were continued at ITI and WrUT. In WrUT some improvements to caption-based image segmentation were elaborated and implemented, in particular specific processing of grid-like subfigure layouts and splitting of big connected components that span more than one subfigure. The article presenting all result achieved so far was also prepared and submitted to FEDCSis2016 conference. The works conducted in ITI concentrated initially on trials to adapt community detection methods to image segmentation. The trials in this direction were however not quite successful, mainly to problems with big number of clustered items (pixels). Therefore, this concept was finally abandoned and ITI researchers successfully adapted density-based clustering methods (DBSCAN) to image segmentation. The main advantage of this method is that it does not require the knowledge on the number of subimages. We observed however that sometimes it leads to apparently incorrect segmentation, where some clusters do not contain any detected captions and other clusters consist merely of caption elements. Probably, including the indication of captions location detected by methods elaborated in WrUT could improve the overall accuracy of segmentation. In the course of consultations carried out during the visit we confirmed the need of further research towards the integration of methods elaborated by WrUT and ITI. We agreed that detailed results of experiments with DBSCAN done in ITI will be delivered to WrUT, where WrUT researchers will elaborate the rough concept of integration of DBSCAN and caption-based methods.

We also came to conclusion that more segmentation accuracy assessments methods should be applied to obtained segmentation results. ITI researchers used variation of information (VoI) method in their recent experiments. We agreed that the same method should be also applied to results obtained by caption-based methods. We agreed that results obtained by both methods will be evaluated using two assessment methods (F1-based and VoI). The re-evaluation will be done at WrUT after delivery of segmentation results obtained in ITI.

Information referring to the intellectual property

This topic was subject to the previous visit in 2014 and this time it was not being considered.

Description of the cooperation between universities and industry

This topic was subject to the previous visit in 2014 and this time it was not being considered.

Other activities

N/A