



www.visceral.eu

Plan and Call for Participation for Competition 2

Deliverable number	<i>D5.2</i>
Dissemination level	<i>Public</i>
Delivery date	<i>30 September 2013</i>
Status	<i>Final</i>
Author(s)	<i>Bjoern Menze</i>



This project is supported by the European Commission under the Information and Communication Technologies (ICT) Theme of the 7th Framework Programme for Research and Technological Development.

Grant Agreement Number: 318068

Executive Summary

This deliverable presents the plan and timeline for the organisation of the second benchmark in the VISCERAL project. This benchmark focuses on the content based retrieval of medical imaging data. It is based on a substantial and representative set of data collected from multiple sites. The aim of the benchmark is to evaluate algorithms for content based medical image retrieval. The deliverable contains the Call for Participation that will be distributed publicly to encourage participation.

Table of Contents

1	Timeline and Plan for Challenge 2	3
2	Call for participation	5
3	Summary	6

Abbreviations

MICCAI ... International Conference on Medical Image Computing and Computer Aided Intervention
ISBI ... International Symposium on Biomedical Imaging
MCV ... Medical Computer Vision workshop

1 Timeline and Plan for Challenge 2

After a focus on segmentation and localization in the first VISCERAL challenge, the second challenge will benchmark algorithms for content based image retrieval on a large data set. Similar to the first challenge we will provide training data to prepare algorithms and will conduct the benchmark evaluation of the participant contributions on a testing set. In the following we outline the schedule of the benchmark preparation and execution.

In the first phase that starts in autumn 2013 we advertise the benchmark, prepare the necessary data, and discuss relevant tasks with potential participant research groups. After disseminating final specifications, in the second phase during spring 2014 we implement the technical infrastructure for the benchmark. The benchmark itself will run through summer 2014, with a central workshop in September as part of MICCAI 2014.

VISCERAL Medical Image Retrieval Challenge

Timeline 2013

Oct	Application for hosting an “ISBI Challenge“ (Oct 1st)
Nov	Preparation of potential queries and examples image sets finished to show case the retrieval problem to possible participants.
Nov	Approach relevant research groups in the field with a questionnaire to evaluate specific interests in the challenge, and to refine benchmark settings to maximize the number of interested participants, if necessary.

Timeline 2014

Jan	Apply for “MICCAI Medical Computer Vision” workshop (MCV) with dedicated session on large data and VISCERAL benchmarks.
Mar	Have queries and relevant example images ready for the training data, have finished quality control of image data and annotations.
Mar	Cloud infrastructure is ready and tested, basic evaluation measures are implemented (such as precision, recall, MAP, NDCG, etc.).
Apr-Aug	Run benchmark 2, provide feedback to participants.
Apr/May	Run on-site challenge at ISBI Beijing with teaser data set
Sept-Nov	Relevance assessment of participant results
Sept/Oct	Organization of MCV workshop session at MICCAI 2014 in Boston (if accepted) in order to discuss with participants of benchmark 1 and benchmark 2. We will also use this venue to disseminate results of benchmark 1.
Dec	Have results of benchmark 2 analysed

Timeline 2015

Feb Have final publication of benchmark 2 ready. We plan a publication in a journal such as Medical Image Analysis or IEEE Transactions on Medical Imaging, and as volume in a book series (e.g., Lecture Notes in Computer Science by Springer).

2 Call for participation



Call for participation

While a growing number of benchmark studies compare the performance of algorithms for automated organ segmentation or lesion detection in images with restricted field of views, no efforts have been made so far towards benchmarking these and related routines for the automated image retrieval visible in an image volume of the abdomen, the trunk or even the whole body.

In order to gauge the current state-of-the-art in automated whole-body image annotation and compare different methodological approaches, we are organizing the "VISCERAL Medical Image Retrieval Benchmark". For this purpose, we are making available a large dataset of clinical MRI and CT scans to be evaluated for similar case retrieval. This will also provide access to automatically annotated images processed from the preceding VISCERAL structure identification and segmentation challenge (www.visceral.eu/benchmark-1/).

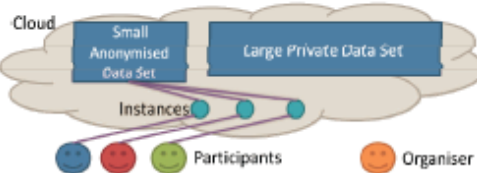
To deal with the large amount of data that are to be processed, we will organize the benchmark relying on a decentralized ("cloud") architecture that will provide participants with access both to several Terabytes of clinical images and computing resources. On each retrieval algorithm installed by the participant on a virtual machine in the cloud, the organisers will submit several queries (topics or rather medical cases) and get a list of results to evaluate against the ground truth. We will evaluate the entries post hoc in collaboration with experts who will annotate the top ranked retrieval results using pooling among all submissions, and will judge whether they are in the same/valid category regarding the defined retrieval specifications as the query case.

How the benchmark challenge will be organized

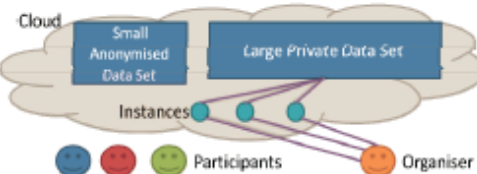
The "VISCERAL Medical Image Retrieval Benchmark" will take place from **1 April 2014 to 30 August 2014**. Within this time window participants can set up, optimize, and train their retrieval routines. After August 2014 the routines will be applied to the test data and results will be released (see below).

For further information see www.visceral.eu/benchmark-2 also providing updates and contact details. We kindly ask possible participants to contact any of the organizers as early as possible.

Training phase: The participants each have their own computing instance in the cloud (provided by VISCERAL), linked to a small dataset of the same structure as the large one. Software for carrying out the competition objectives is placed into the instances by the participants. The large data set is kept separate.

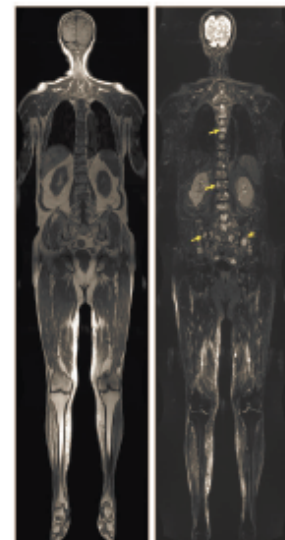


Testing phase: On the competition submission deadline, the organizer takes over the instances from the participants, links them to the large data set, executes the software on the large dataset and evaluates the results.



A vertical strip of logos for the participating institutions and the project. From top to bottom: the Seventh Framework Programme logo; TU WIEN (Technische Universität Wien) logo; Hes·so (Haute Ecole Spécialisée de Suisse occidentale) logo; MEDIZINISCHE UNIVERSITÄT WIEN logo; ETH (Eidgenössische Technische Hochschule Zürich) logo; UniversitätsKlinikum Heidelberg logo; and Agència d'Informació, Avaluació i Qualitat en Salut logo. Below the logos, text reads: "The VISCERAL Identification, Localization and Segmentation Benchmark is organized as part of the EU FP7 project VISCERAL".

www.visceral.eu



3 Summary

In this deliverable we outline the timeline of the second VISCERAL benchmark. It includes the advertising of the benchmark in late 2013, the preparation of data sets, and benchmarking infrastructure during early 2014, the running of the benchmark in summer 2014, and the analysis and publication of the benchmark results in late 2014, and early 2015.

The second VISCERAL benchmark will focus on content based image retrieval, and will be conducted based on a large representative medical imaging data set. It will be organized in close coordination with ISBI 2014, and MICCAI 2014, since these are the primary research communities, for whom the benchmark is relevant.