

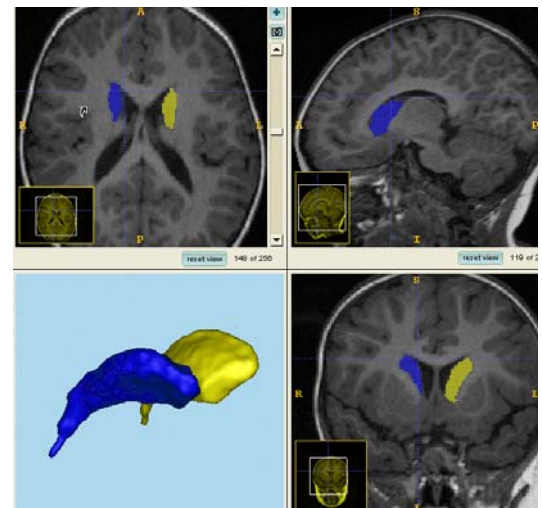
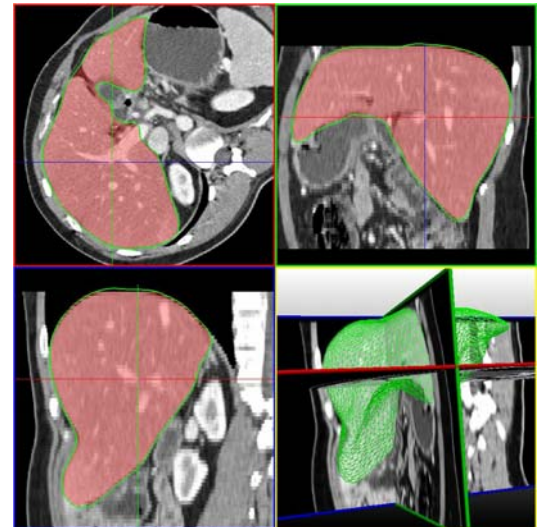
Workshop on 3D Segmentation in the Clinic: A Grand Challenge

- Call for Papers -

The Background: Segmentation is still the main bottleneck for the breakthrough of many computer assisted procedures because it remains tedious, time-consuming, and subjective. As computer scientists, we develop new algorithms to support or completely automate this work at a growing pace; we present papers at conferences and publish articles in journals. Each publication claims to improve on some previous work, but most algorithms are tested only on a handful of images, making an objective comparison between different methods impossible. In the end, only a tiny fraction of these developments actually reach the clinic, and rumor has it that many new methods will fail miserably if tested on real clinical data from different sources.

The Challenge: This workshop presents a contest for automatic segmentation methods in two ambitious and relevant applications of medical image analysis: The 3D segmentation of the caudate nucleus in brain MRI images and of the liver in abdominal CT images. After signing a letter of intent, participants can download training datasets (with manual reference segmentations) from a designated website in order to train and tune their algorithms. To qualify for the challenge, authors have to run their algorithms on a first set of supplied test data and upload the resulting segmentations. The results (numbers, tables and figures) will be mailed back and must be included in the paper. The main competition will take place on an additional set of unseen test datasets, either live at the workshop (if participants run the segmentation on their own laptops) or in advance by the organizers (if participants send in executables of their algorithms on supported platforms). Results will be compared with manual reference segmentations using a number of evaluation metrics; they will be ranked and presented for the first time at the workshop. The winners of each category will be awarded with small prizes, and endless fame and glory.

The Submissions: We encourage submission of both new and already published methods for this workshop. The main focus (and criterion of acceptance) is the performance of the algorithms on the supplied test data. Using the Springer [LNCS format](#), we suggest a length of four to six pages for papers presenting previously published algorithms and eight pages for original work. There is no need for anonymity. All accepted papers will be presented as posters, the methods reaching the best results in the main competition will be discussed in detail.



The Dates:	Open for submission of letter of intent	- 2 nd of April
	Deadline for submission of letter of intent	- 18 th of May
	Deadline for submission of segmentation results on initial test data	- 6 th of July
	Notification of results (with tables and figures)	- 16 th of July
	Deadline for submission of full papers, including supplied tables and figures	- 20 th of July
	Notification of acceptance	- 30 th of July
	Principal deadline for workshop registration	- 3 rd of August
	Deadline for submission of camera-ready copy	- 13 th of August
	Workshop in Brisbane, Australia	- 29 th of October

The Details: The first step to participation is to download and sign a letter of intent and data agreement. After the workshop organizers have received the signed letter, you will be given access to the training and initial test data of the application of your choice (it is also possible to participate in both categories). All data is supplied as ITK metadata (ASCII readable header file “.mhd” and raw data file “.raw”). To train and tune your algorithm, you can use the supplied training data and all additional data you might have access to. The segmentations on the initial test data have to be uploaded to a designated website; and a report about the segmentation performance (including tables and figures) will be issued to the authors. This report needs to be included in the submitted full paper. The segmentation evaluation in this workshop incorporates the signed volumetric difference, Pearson correlation coefficients, volumetric overlap, RMS surface distance and maximum surface distance. A segmentation result is considered successful if the following minimum requirement is met: 50% volumetric overlap for the caudate nucleus and 80% for the liver. Segmentations with lower scores are considered as failed and will not be included in the metric computations. For the main competition at the workshop, all submissions for each test image and each metric will be ranked and scored to produce one final score. The individual metrics, failure rates and the rankings will be reported during the workshop. The best-scoring algorithms will be discussed in detail in work-groups at the workshop itself. After the workshop, a large comparison and review paper will be compiled by the workshop organizers for each of the two applications with all participants as co-authors. These two papers will be submitted to high-ranked journals.

If your algorithm is able to segment 10 caudate nuclei or 10 livers in less than three hours, you can perform the final evaluation live at the workshop, bringing your own laptop computer. Otherwise, you can also send Linux/MacOSX/Windows stand-alone executable files of your algorithm to the workshop organizers who run the segmentation (after the notification of acceptance). Obviously this option is only available for fully automatic methods that do not necessitate user interactions. In the case that neither of these options present a viable solution (e.g. due to platform, frameworks or other forms of dependencies), you can still submit papers and present a poster at the workshop based on the initial test data. But your submission cannot take part in the final competition and will remain unranked. If you intend to submit a semi-automatic method, please note that any interaction is limited to pre-processing and initialization of an automatic computation stage. Semi-automatic methods will be ranked and scored separately from fully automatic ones.

The Organizers:

Tobias Heimann	Medical and Biological Informatics, German Cancer Research Center, Germany
Bram van Ginneken	Image Sciences Institute, University Medical Center Utrecht, The Netherlands
Martin Styner	Neuro Image Analysis Laboratory, University of North Carolina at Chapel Hill, USA

The Website: More detailed and updated information regarding this workshop (and a download link for the letter of intent) is available at the website

<http://mbi.dkfz-heidelberg.de/grand-challenge2007>