

First Announcement – Call for Participation

“1st European Scanner Contest (ESC)”

-Berlin-Brandenburg-Vilnius-

T. Schrader^{1,2}, P. Hufnagl¹, M.G. Rojo³, A. Laurinavicius⁴

¹Institut für Pathologie, Charité – Universitätsmedizin Berlin, Germany, ²Fachhochschule Brandenburg, Brandenburg, Germany, ³Servicio de Anatomia Patologica, Hospital General de Ciudad Real. ⁴National Centre of Pathology, Vilnius, Lithuania

Contact:

Prof. Dr. Thomas Schrader	Prof. Dr. Peter Hufnagl
Department of Informatics and Media	Department of Digital Pathology and IT
University of Applied Sciences Brandenburg	Charité - Universitätsmedizin Berlin
Magdeburger Str. 50	Charitéplatz 1
14770 Brandenburg, Germany	10117 Berlin, Germany
thomas.schrader@computer.org	peter.hufnagl@charite.de
Mob.: ++49-(0)176-96906763	Mob.: 0049-(0)172-877 4394
Tel.: +49 (0)3381-355 423	Tel: ++49-(0)30-450 536 140

Invitation

All manufacturers of slide scanner are invited to participate in the First European Scanner Contest in Berlin, Brandenburg, and Vilnius (Lithuania), under the auspices of the European Union, the COST Action IC 0604 “Eurotelepath”, an International consortium of computer scientists and pathologists, and the Bundesverband Deutscher Pathologen e.V. (professional association of German pathologists). Similar to the Connectathons of the IHE, the contest has the aim to explore the current status of scanner technology development. The results may be used for customer support as well as for developer/vendor support to find advantages and disadvantages of technical and software solutions with respect to application fields and context.

The development progress for scanning technology is high and consequently the

1st European Scanner Contest (ESC)

European Scanner Contest – ESC will take place every two years.

Schedule & Locations

The first contest will pass three phases. With respect to the premiere of the ESC, comments and proposals are welcome during every phase of the ESC.

Phase 1 – Design of ESC

- **Schedule**
 - February-March 2010: discussion of the ESC conditions and evaluation schemes, practical evaluation tests, preregistration of vendors
 - April 10th, fixation of schedule, test and evaluation design
 - April 30th, deadline for registration of vendors to scanner contest
- **Comment:** Mutual participants are invited to comment the design and the different modes for the presentation of results of the contest. Proposals for application of software tools for automatic evaluation are welcome.

Phase 2: 1st ESC in Berlin

- **Location:** Berlin Congress Center, in the forefront of the 94th Annual Meeting of the German Society of Pathology
- **Schedule**
 - May 24th – 26th, 2010: Scanning of slides in different disciplines (see below)
 - May 27th – 30th, 2010: Preliminary evaluation, presentation of first results on the 94th Annual Meeting of the German Society for Pathology
- **Comment 1:** Final results will be given in Vilnius (Phase 3)
- **Comment 2:** Scanning under ESC conditions takes place in a 250 m² room under supervision of referees. The contest room will be open to a restricted number of employees of each participating company between 8 a.m. and 6 p.m. and will be inaccessible at any other time.

Phase 3: Presentation of final results of the ESC in Vilnius

- **Location:** Vilnius, in forefront of the 10th European Congress on Telepathology and 4th International Congress on Virtual Microscopy
- **Schedule**
 - July 1st - 3rd, 2010 – Presentation of the final results in the different disciplines
 - Panel discussion of the ESC idea and future organization
- **Comment:** Organization of the 2nd ESC will be fixed at the end of the 1st ESC.

Contest Areas

The following table gives an overview of the planned disciplines of the 1st contest:

1	High throughput	A: 20x	60 (H&E)	speed, focus, particles, stitching
		B: 40x	60 (H&E)	speed, focus, particles, stitching
2	Cytology	A: 40x, gyn. smears	6 (Pap.)	speed, focus, stitching,
		B: 100x, blood smears	6	speed, focus, stitching
3	Education	Best quality	10 (div.)	focus, quality,
4	Research	Mesh grid	1-3	geometry, scanning area

1. High throughput scanning in the different magnifications (automatic batch scanning) with magnifications A: 20x B: 40x

- **Task**
 - Scan 60 slides in a routine process. No interaction beside a quick setting before the batch scan and reloading the scanner with slides is allowed.
 - Slides from 3 departments (each 20) are mixed randomly
- **Goal**
 - Compare time for scan preparation
 - compare scanning time and image quality under daily-use conditions in a clinical pathology lab
- **General conditions**
 - HE only
 - A technician is allowed to make settings before the scan. Time therefore is taken separately.
 - Slides are randomly selected from the daily workload of three different pathological institutes with 20 slides from each institute. Several sets of mixed slides are provided
 - Regions on the slides are not marked, all relevant particles have to be found automatically
 - 40 biopsies of different origin, 20 specimen of surgical material

2, Cytology scanning with the two different disciplines: A: Gynecology smears 40 x B Blood smears 100x oil immersion

- **Tasks**
 - Scan 6 slides with gynecology smears in a routine process (one layer)
 - Scan 6 slides with blood smears in a routine process (one layer)
- **Goal**
 - Comparison of scanning time and image quality
- **General conditions**
 - Slides are randomly selected from the archives of three institutions with 2 from each site

3. Education - superior quality scanning

- **Task**
 - Scan 10 slides for best quality without time limit. Human interaction to improve scanning quality is allowed. Post processing with separate programs like Photoshop is not allowed.
- **Goal**
 - Comparison of image quality for education purposes
- **General conditions**
 - Slides represent very different types of tissue and staining,

Physical/ optical parameters

- **Task**
 - Scan of standardized slides related to geometry (grid pattern)
- **Goal**
 - Calculation of the difference between grid and scanning results
- **General conditions**
 - Scanning with human interaction

Evaluation of the results

The evaluation is a stepwise process:

- Automatic analysis – sharpness, stitching, unrecognized regions

1st European Scanner Contest (ESC)

- Manual analysis – a multilevel process
- Evaluation and presentation of results. There are several modes under discussion - please indicate your favorite mode:
 - **Mode I - Categorization:** Results are separated into the categories A – very good, B - good and C acceptable, D- insufficient,
 - **Mode II - Point System:** The results are transferred into a point system which ranges for single descriptors between 0 and 100.
 - **Mode III – Ranking:** Results are ranked and ranks as well as original results are presented
- Participating companies may decide which results should be part of the contest and which not. Therefore they will get an Excel sheet with all results with anonymized data.

General rules

- Every participating company can freely decide to take part in any of the different disciplines of the contest.
- All slides are provided by the organizing committee.
- The contest room is supervised by referees who organize the turnaround of the slide series and perform time measurements.
- Participating companies may use maximal 2 different scanners. These scanners may be identical or of different type. If different types are included results will be analyzed and displayed separately.
- Evaluation results can be reviewed/ commented on by participants.

ESC Future

Future scanner contests will include additional disciplines, e.g. z-stacks, immunofluorescence, registration of different stained serial slides, color reproduction, barcode recognition,....

Next Steps:

- Please give feedback to the regulations of the planned contest and feel free to make any remark, proposal or critical question you have
- Please confirm your participation of the European Scanner Contest as soon as possible.