

Results of Contest MITOS ATYPIA 2014

Mitosis Detection and Evaluation of Nuclear Atypia Score
in Breast Cancer Histological Images

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Institute for
Infocomm Research



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Contestants

- End of June 2014, there was 108 teams registered
- End of July 2014: Results received from 11 teams

11 Teams

CUHK	Hao Chen, Pheng Ann Heng — Dept. of Computer Science and Engineering Lin Shi — Dept. of Medicine and Therapeutics Defeng Wang — Dept. of Imaging and Interventional Radiology The Chinese University of Hong Kong	Hong Kong
CUHK-ZHEJIANG	Hao Chen — Computer Science and Engineering, The Chinese Univ. of Hong Kong Lequan Yu — Dept. of Computer Science and Technology, Zhejiang University	Hong Kong China
LIPADE1	Maya Alsheh Ali, Nicolas Loménie, Laurent Wendling LIPADE, Université Paris Descartes	France
LIPADE2	Mickaël Garnier, Nicolas Loménie, Laurent Wendling LIPADE, Université Paris Descartes	France
MINES-CURIE-INSERM	Xiwei Zhang, Thomas Walter MINES ParisTech, PSL Research Univ., CBIO — Centre for Computational Biology Institut Curie INSERM U900	France France France
SHAANXI	Cheng Lu — College of Computer Science, Shaanxi Normal University	China
STRASBOURG	Grégory Apou, Germain Forestier, Benoît Naegel, Cédric Wemmert Université de Strasbourg	France
UNAL1	Ricardo Moncayo, David Romo, Eduardo Romero CIM@LAB Research Group, Universidad Nacional de Colombia	Colombia
UNAL2	Raúl Celis, David Romo, Eduardo Romero — Universidad Nacional de Colombia	Colombia
YILDIZ	Gokhan Bilgin — Yildiz Technical University, Istanbul	Turkey
WARWICK	Korsuk Sirinukunwattana, Adnan Khan, Nasir Rajpoot — University of Warwick Chachlani Naresh — University Hospitals Coventry and Warwickshire	UK UK

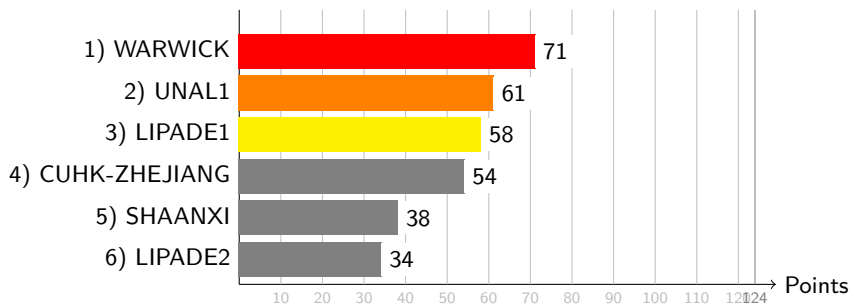
Nuclear Atypia: Metrics

Ranking: Number of points

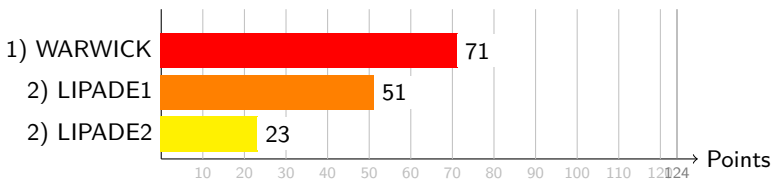
Proposed score = Ground truth score	1 point
Proposed score different by 1 unit from ground truth score	0 point
Proposed score different by 2 units from ground truth score	-1 point

Ranking Nuclear Atypia

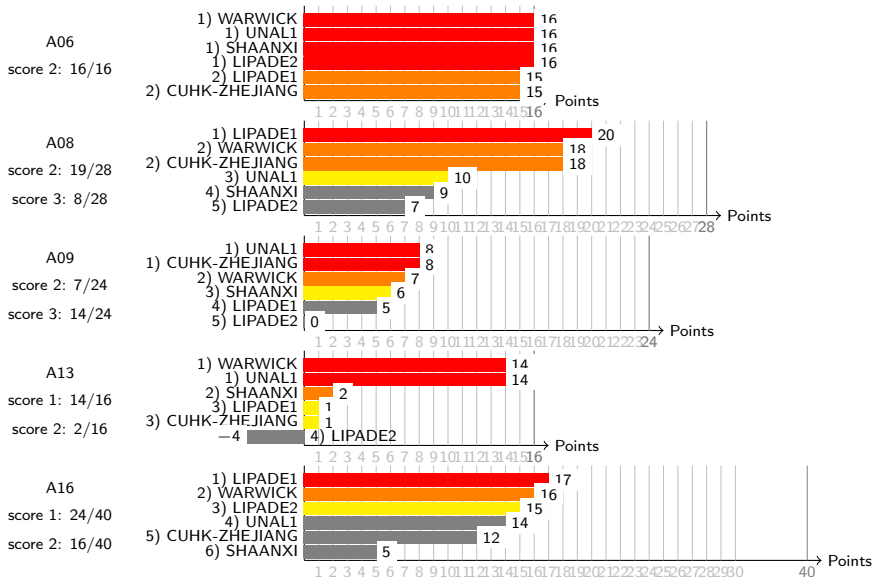
Aperio



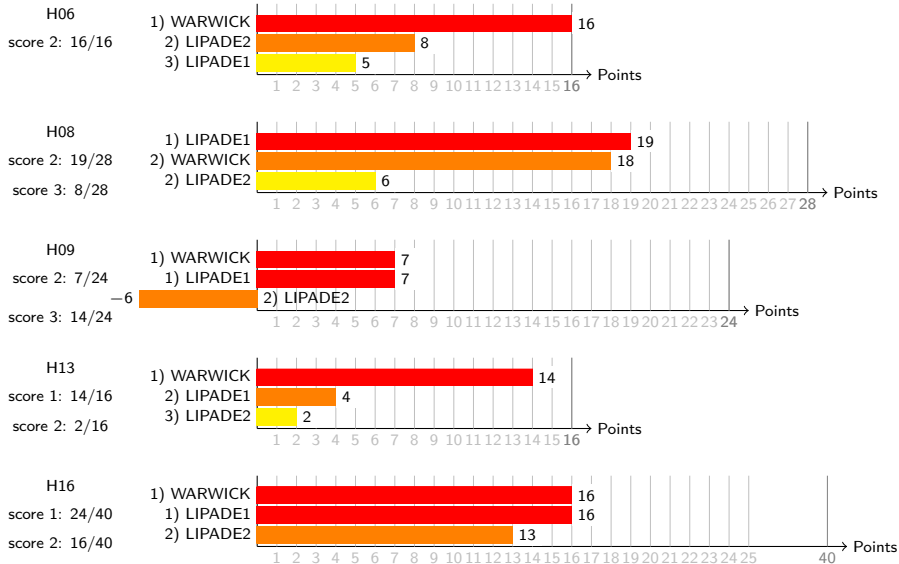
Hamamatsu



Ranking Nuclear Atypia per Slide (Aperio)



Ranking Nuclear Atypia per Slide (Hamamatsu)



Mitosis: Metrics

Ranking: F-measure

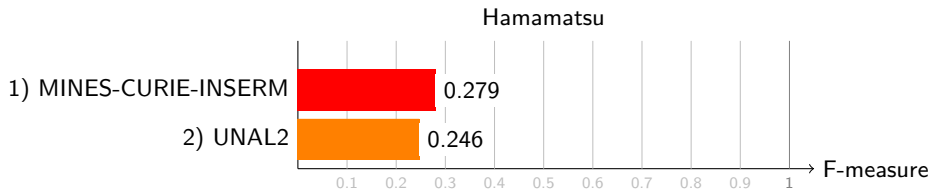
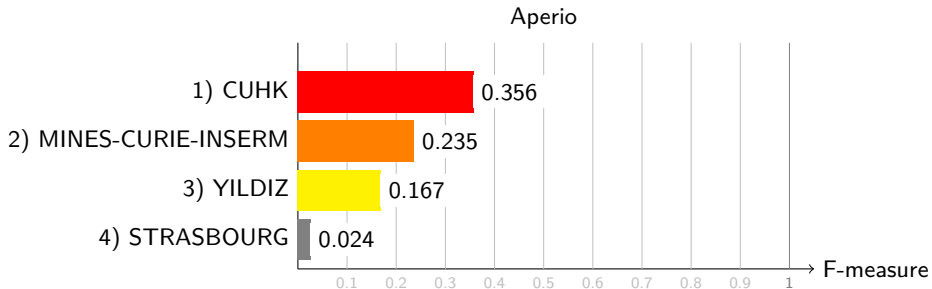
TP: Detected mitosis having its centre point localised within a range of $8\mu\text{m}$ from centre of a ground truth mitosis

$$\text{recall} = \frac{\text{TP}}{\text{TP} + \text{FN}}$$

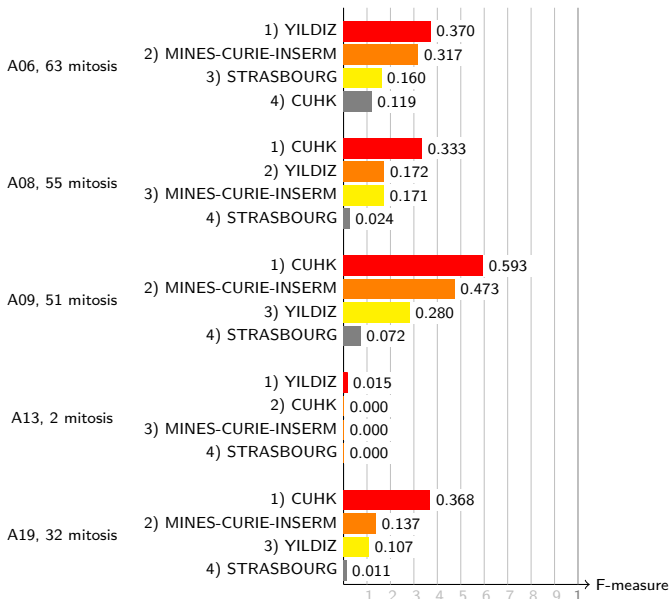
$$\text{precision} = \frac{\text{TP}}{\text{TP} + \text{FP}}$$

$$\text{F-measure} = 2 \times \frac{\text{precision} \times \text{recall}}{\text{precision} + \text{recall}}$$

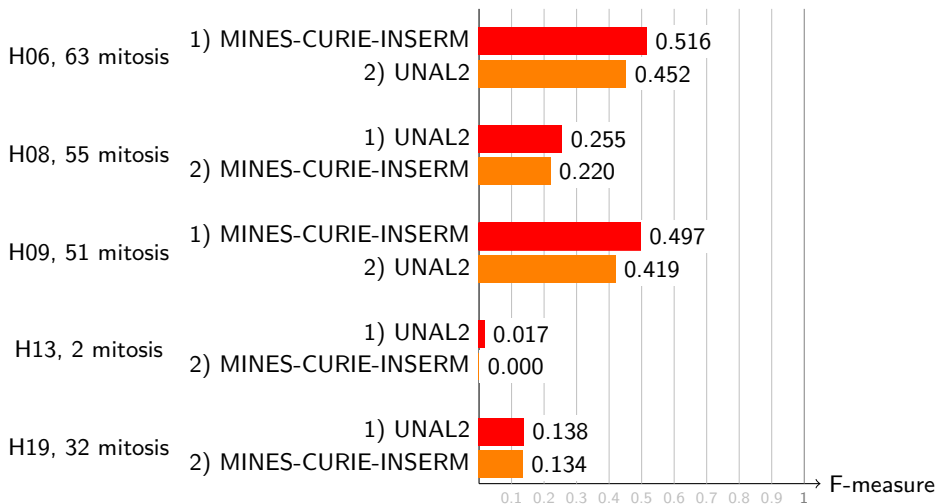
Ranking Mitosis



Ranking Mitosis per Slide (Aperio)



Ranking Mitosis per Slide (Hamamatsu)



Thank You for your Attention



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