# UEG Week 2015 - Abstract Submission
*Topic area: 11. ENDOSCOPY AND IMAGING*

*Topic: 11.2. Endoscopy, colon*

UEG15-ABS-2683

**COLONIC POLYPS ARE CORRECTLY IDENTIFIED BY A COMPUTER VISION METHOD USING WM-DOVA ENERGY MAPS**

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**Has this abstract previously been presented?:** No
**Has this abstract been previously published?:** No
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**Does the presenting author fulfil the criteria and want to apply for the travel grant?:** Yes
**Travel grant selection:** Clinical Science travel grant
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**Introduction:** Polyp miss-rate is a drawback of colonoscopy that results in a lack of total effectiveness in preventing colorectal cancer. The miss-rate increases significantly in small polyps.

**Aims & Methods:** To evaluate the usefulness of a computer vision method for the identification of colonic polyps.
612 polyp images were used from a data base (CVC-ClinicDB) containing an average number of 20 frames (range 2-25) of 31 different polyps. Our method is based on a model of appearance for polyps which defines a polyp as a protrusion enclosed by valleys of different intensity image. Valley information allows the creation of energy maps (WM-DOVA) related with the likelihood of polyp presence in the image.

**Results:** 22 polyps were small (< 10 mm), representing a total of 430 frames of the database: 11 non-polypoid (IIa and IIb), 9 sessile (Is) and 2 pedunculated (Ip) with a total of 218, 162 and 50 frames, respectively. All polyps were correctly localized in at least one frame. The number of frames with correct localization was 308 (71.6%) in small polyps compared with 122/182 (67%) in polyps $\geq$10 mm (p=0.2) (table). Small non-polypoid polyps were correctly localized in more frames than all the other types: 169/218 (77.5%) vs 261/394 (66.2%); p=0.003. In the 182 frames without a correct polyp location, the possible causes of failure were: folds in 81 (43.8%), polyps in a lateral position in 57 (30.8%), blood vessels in 21 (11.3%), absence of valleys in 12 (6.5%), fecal content in 7 (3.8%) and others in 4 (2.1%).

| | # of polyps | # of frames | # of frames with correct localization | # of frames per polyp | # of frames with correct localization per polyp | # of polyps with at least one frame with correct localization |
|---|---|---|---|---|---|---|
| <10mm | 22 | 430 | 308 (71.6%) | 19.5$\pm$6.3 (2-25) | 14$\pm$6.8 (1-24) | 22 (100%) |
| IIa + IIb | 11 | 218 | 169 (77.5%) | 19.8$\pm$5.3 (6-25) | 15.4$\pm$7 (2-24) | 11 (100%) |
| Is | 9 | 162 | 105 (65%) | 18$\pm$7.6 (2-25) | 11.7$\pm$7.3 (1-22) | 9 (100%) |
| Ip | 2 | 50 | 34 (68%) | 25$\pm$0 (25-25) | 17$\pm$1.4 (16-18) | 2 (100%) |
| $\geq$10 mm | 9 | 182 | 122 (67%) | 20$\pm$7.1 (5-25) | 13.8$\pm$8.3 (3-25) | 9 (100%) |
| IIb | 1 | 12 | 6 (50%) | | | 1 (100%) |
| Is | 2 | 46 | 31 (67.4%) | 23$\pm$2.8 (21-25) | 15.5$\pm$12 (7-24) | 2 (100%) |

| lp | 6 | 124 | 85 (68.5%) | 20.7±7.8 (5-25) | 14.5±8.3 (3-25) | 6 (100%) |
|----|---|-----|------------|-----------------|-----------------|----------|

**Conclusion:** Computer vision method WM-DOVA shows good performance for the identification of colonic polyps, particularly those small non-polypoid which are the most difficult to detect during colonoscopy. These results indicate a potential applicability in clinical practice and warrant further clinical studies.
**I confirm having declared any potential Conflict of Interest for ALL authors listed on this abstract:** Yes