



Announces the Ph.D. Dissertation Defense of

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for the degree of Doctor of Philosophy (Ph.D.)

“Analysis of Eye Response to Video Quality and Structure”

Nov. 9, 2017, 3 p.m.
Engineering East, Room 405
777 Glades Road
Boca Raton, FL

DEPARTMENT:

Computer and Electrical Engineering and Computer Science

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ABSTRACT OF DISSERTATION

Analysis of Eye Response to Video Quality and Structure

Real-time human eye recognition and tracking systems with human-computer interaction mechanism are being adopted to advance user experience in smart devices and consumer electronic systems. Eye tracking systems measure eye gaze and pupil response non-intrusively. This research presents an analysis of eye pupil and gazes response to video structure and content. The set of experiments for this study involved presenting different video content to subjects and measuring eye response with an eye tracker. Results show significant changes in a video and scene cuts lead to sharp constrictions. User response to videos can provide insights that can improve subjective quality assessment metrics. This research also presents an analysis of the pupil and gaze response to quality changes in videos. The results show pupil constrictions for noticeable changes in perceived quality. Gaze responses show higher fixations/saccades ratios with lower video quality showcasing more effort by users in discerning features. Using real-time eye tracking systems for video analysis and quality evaluation can open a new class of applications for consumer electronic systems.

BIOGRAPHICAL SKETCH

Born in the India

B.S. 2008, Jawaharlal Nehru Technological University, India

M.S. 2011, Florida Atlantic University, Boca Raton, Florida

Ph.D. 2017, Florida Atlantic University, Boca Raton, Florida

CONCERNING PERIOD OF PREPARATION & QUALIFYING EXAMINATION

Time in Preparation: 2013 - 2017

Qualifying Examination Passed: Spring 2014

Published Papers:

Pappusetty, D., & Kalva H. (2018). Measuring Video Quality by Eye Response, *In Human Vision & Electronic Imaging Conference* (Under Review).

Pappusetty, D., Kalva H., & Hock H. S. (2017). Pupil Response to Quality and Content Transitions in Videos. *IEEE Transactions on Consumer Electronics* (Accepted).

Pappusetty, D., & Kalva H. (2017). Eye Response to Blockiness Artifacts in Video. *In European Conference on Eye Movements (ECEM)* (In Press).

Pappusetty, D., Chinta, V. V. R., & Kalva, H. (2017). Using pupillary response to assess video quality. *In IEEE International Conference on Consumer Electronics (ICCE)* (pp. 64–65).
<https://doi.org/10.1109/ICCE.2017.7889231>

Pappusetty, D., & Kalva, H. (2016). Reducing Inattentional Blindness Using Subliminal Cueing in Visual Performance Tasks. *Electronic Imaging, 2016(16)*, 1–5.
<https://doi.org/10.2352/ISSN.2470-1173.2016.16.HVEI-118>
(Honorary Mention 2nd Best Student Paper Award).

Bhatt, J., Pappusetty, D., Kalva, H., & Naik, M. (2016). Image retargeting for wearable devices. *In 2016 IEEE International Conference on Consumer Electronics (ICCE)* (pp. 55–57).
<https://doi.org/10.1109/ICCE.2016.7430520> **(Best Student Paper Award).**

Elafoudi, G., Stankovic, V., Stankovic, L., Pappusetty, D., & Kalva, H. (2015). Evaluation of Signal Processing Methods for Attention Assessment in Visual Content Interaction. *In New Trends in Image Analysis and Processing -- ICIAP 2015 Workshops* (pp. 580–588). Springer, Cham. https://doi.org/10.1007/978-3-319-23222-5_70

Pappusetty, D., & Kalva, H. (2014). Effect of Subliminal Cueing on In-attentional Blindness. *In Proceedings of the 1st International Workshop on Perception Inspired Video Processing* (pp. 39–40). New York, NY, USA: ACM. <https://doi.org/10.1145/2662996.2666156>

Pappusetty, D., & Kalva, H. (2017). Eye Response as Video Quality Metric (Manuscript under preparation).

Patent Applications & Copyrights:

Kalva, H., & Pappusetty, D., System and Method to Reduce In-attentional Blindness and Change Blindness. Provisional patent application file No. FAU 201416.

Kalva, H., Pappusetty, D., & Furht, B, Software for Automated Data Backup. Copyright registration No. TXu001913320.