



## The effects of 2nd-order feature interactions in predicting human gaze Farhan Baluch, Laurent Itti



In this study we address the question of how individual features may be combined to guide bottom-up attention.

We compare the performance of several models including:

- 1) a simple linear model
- 2) a weighted linear model which was optimized using a genetic algorithm approach
- 3) a weighted linear 2nd-order model representing feature interactions
- 4) finally a highly non-linear max model











## Methods

- 8 subjects watched videos containing synthetic and natural scenes.

- a total of 158,476 frames of video were shown to subjects (~25min of video)

- Eye tracking was conducted with an ISCAN eye tracker at 240Hz

- the instruction was to "follow main actors and actions in the scene and not worry about the details"



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-An Interobserver model performs a lot better than either single features or simple bottom-up models that linearly sum features.











- We investigated several models of feature integration and evaluated how well each model can predict human gaze.

-We found that while some 2nd-order feature combinations may recieve a fairly high score, the contribution of 2nd-order feature interactions in gaze prediction is minimal.

-We are currently investigating a new dynamic highly non-linear feature interaction rule that may be at play when humans engage in visual tasks.

Acknowledgements

-Supported by DARPA & NSF.

-The views, opinions, and/or findings contained in this poster are those of the author/presenter and should not be interpreted as representing the official views or policies, either expressed or implied, of the Defense Advanced Research Projects Agency or the Department of Defense.