# Emergent Properties of Foveated Perceptual Systems

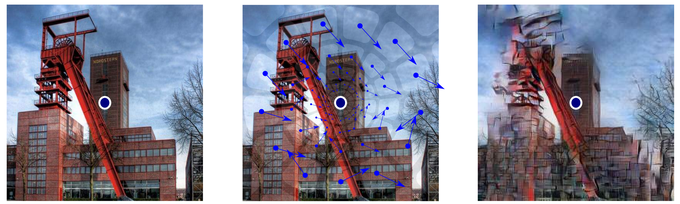
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CENTER FOR Brains Minds+ Machines

## Introduction

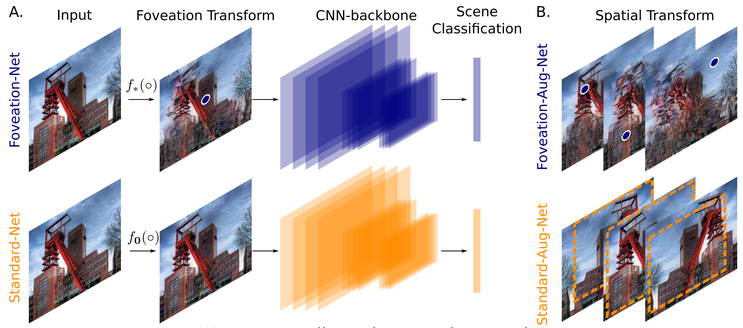
*Efficiency vs Functionality*




Deza et al. ICLR 2019

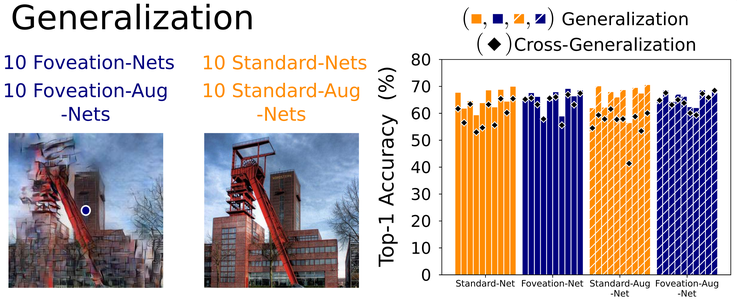
## Methods

*Foveated Perceptual Systems*



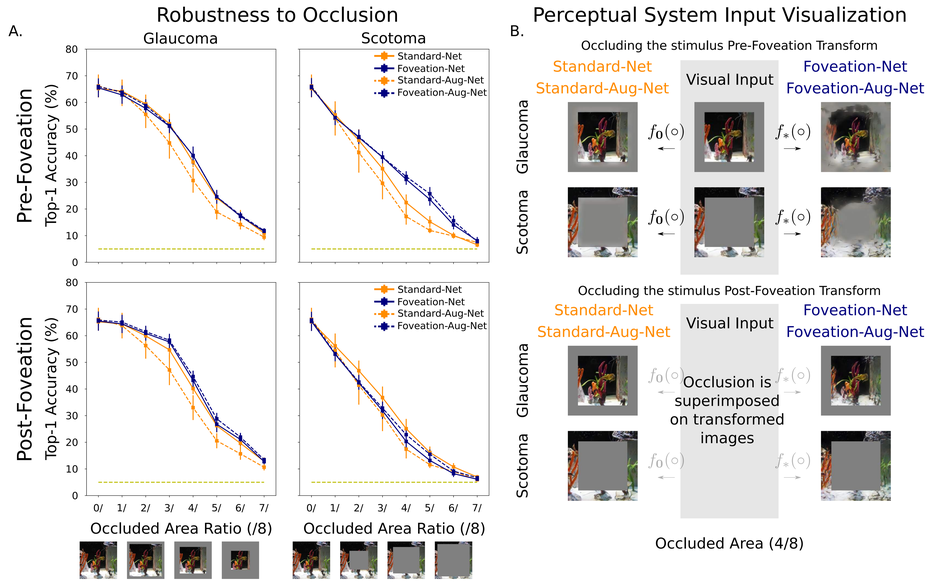

*We perceptually evaluate each network!*

## Generalization



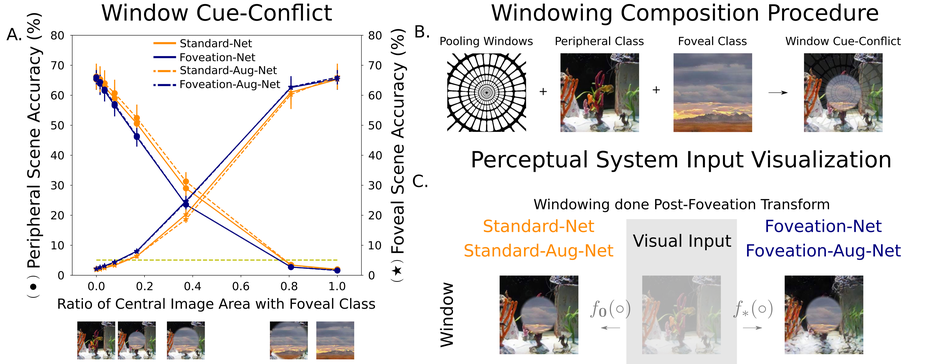

*Foveation-Nets* have higher cross-generalization than *Standard-Nets*

## Robustness to Occlusion



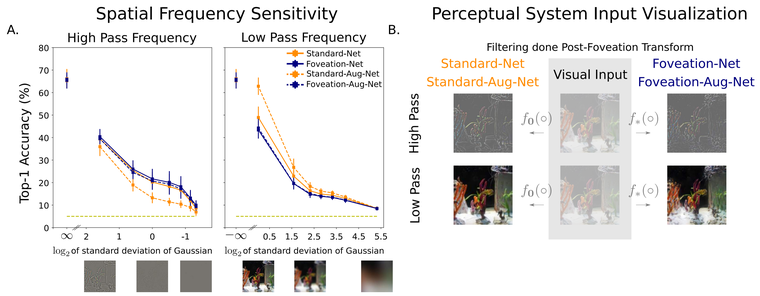

*Robustness to Scotomal Occlusion stems from the foveation process*

## Center Image Bias




*Foveation-Nets* are more biased than *Standard-Nets* to central image regions

## Spatial Frequency Sensitivity




*Foveation-Nets* are less sensitive than *Standard-Nets* to low spatial frequency

## Discussion

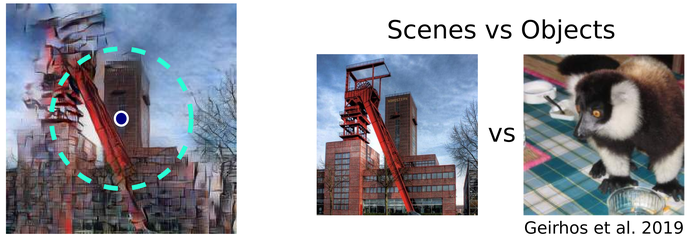
*All results are amplified for the augmented variants of each system*




*No perceptual difference*

*Lower cross-generalization, robustness and sensitivity biases*

***Foveation induces a central focusing mechanism***




Please see our NeurIPS 2020 submission for more details: "Emergent Properties of Foveated Perceptual Systems"