COLGATE UNIVERSITY
13 Oak Drive
Hamilton, NY 13346-1385

Institutional Review Board Proposal Cover Sheet

Title of Project: Growing Sight: Using Real-world Images to Develop an Unconstrained Neural Network for Contour Integration**.**

Anticipated number of participants: females: _<10__ males: _<10__ Approximate ages: ___3-6_____

Submission date: _XX_/_XX_/_XXXX Anticipated start date: _XX__/_XX__/XXXX

_____ **Expedited Review**: for research that does **not** manipulate participants' behavior, use deception, threaten privacy, or cause stress to participants (e.g. observational studies, studies of archival data, some questionnaire and interview studies). Review takes approximately 5 days.

__X__ **Full Review**: for all research that is not eligible for expedited review. Reviews occur once each semester.

Investigator(s): Investigator Name Here_____
_____
_____

Faculty Supervisor: Supervisor Name Here (if applicable)_____

Contact information for Principal Investigator:

Name: Investigator Name Here_____

Phone: w /w2AA<</MCID 26 BDC 27 BSBDC-BDCx_____ Phone:71( )90(

Purpose of Investigation and Procedures

The human visual system is a complex network of neurons in the brain that uses information from the eyes to form internal representations of the world. One of the difficulties in this task is that the eye sends only small pieces of segmented information; the brain must therefore construct a representation of the world by linking or "integrating" segmented information from the eyes together into lines, curves, edges, and patterns. This process has been referred to as contour integration (Field, Hayes, & Hess, 1993) and is fundamental to visual perception. It is believed that the neurons in the brain are connected to one another in a specific pattern to perform this task. Specifically, if the small pieces that make up a contour are oriented in the same direction as the curve, they are more likely to be detected then if those pieces are randomly aligned or jagged. The connection rule, termed the "association field" by Field et al. (1993), which governs performance for detecting smooth contours resembles a bow tie shape and has been hypothesized to form over the course of early visual development. Recently, we have designed an artificial neural network which will enable us to test a number of aspects of the association field model. The images that will be sent to the neural network are chosen based on the parts of images normal adults look at (i.e., fixate). In order to test developmental aspects of the association field, we will also need to send the network image patches that have been fixated by small children. Accordingly, we will need to measure where young participants (aged 4-6 years) look when viewing different pictures of real-world content.

The current study will involve asking young children to simply look at a series of digital images presented on a CRT display monitor. The images consist of pictures taken from different forests across the mid-west and will contain no objectionable material. In order to help hold thdesign biveimcontent. eaa(G[bytr.

encrypted into the participant code described above. The participant code will be assigned to each of the data files that each participant generates via participation. All data files will be stored in electronic format on one of the lab computers and will be backed-up periodically and stored in a secure location. Only the principal investigator of this study and his faculty supervisor will have access to the data.

Manner of Obtaining Participants

Participants will be recruited from the local community through preschools and experimenter connections in Hamilton (e.g. a relationship with a religious community with an active children's program). Parents of all potential participants will receive a full description of the experiment (including a copy of the consent form) prior to an invitation for their child's participation. Parents will be asked to sign the Certificate of Informed Consent after they have arrived at the designated experiment site and have had a chance to look over the experimental set-up. If the parents agree to allow their child to participate and have signed the Certificate of Informed Consent, their child will then be asked if (s)he would like to participate (via the assent form). Participants will receive a number of stickers as compensation for their participation.

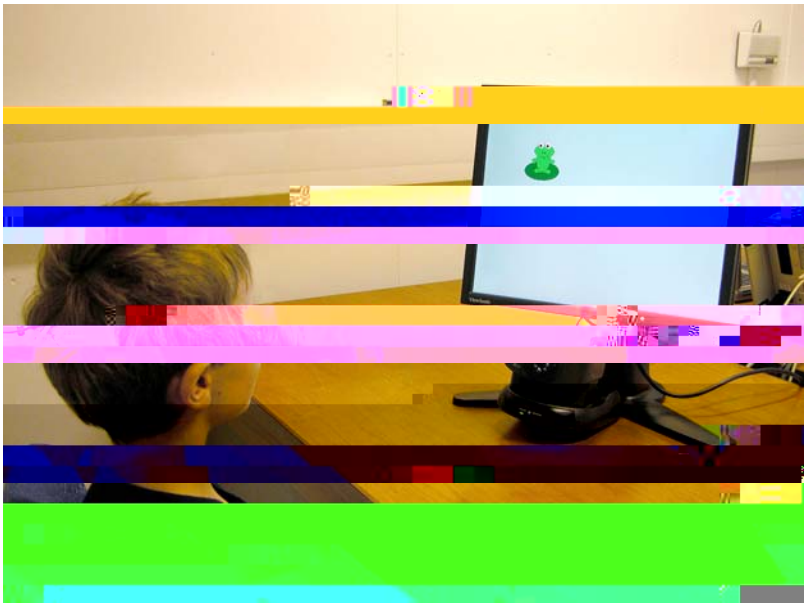
References

Field, D. J., Hayes, A., & Hess, R. F. (1993). Contour integration by the human visual system: evidence for a local "association field". *Vision Research*, 33(2), 173-193.

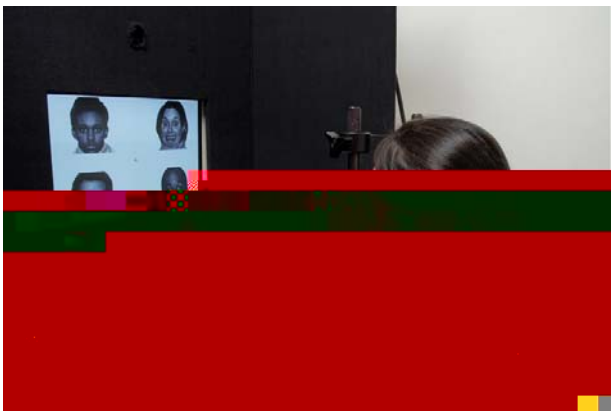
Parent Certificate of Informed Consent

Overview and Procedure.

Child Certificate of Informed Assent



The following document will be read out loud to the child by the experimenter: Do you see the camera underneath the computer screen in this picture? That camera is looking at the boy's eyes to find out where he is looking on the screen, so it knows that he is looking at the green frog right now. We have a camera like this here at the college called "Minty". We want to show you some pictures of the outside, things like forests and lakes, and find out what you like to look at. I can tell you how it works if you like. You will have some time to look at each picture, so take your time. And every once in a while there will also be some pictures of characters from television, so keep your eyes open.



Now do you see the headrest the girl is using? The camera looking at her eyes doesn't move very easily, so the headrest is there so she doesn't get too far away from it. Our camera is the same way, so when we get to the room you'll find a headrest there too. You'll need to keep your chin on the rest just like the girl in the picture, but if you get tired we can stop for a while before we continue.

Your mom/dad can stay with you for the whole time, and the whole thing probably won't take longer than an hour. So do you think you understand what we're going to be doing today?

Okay then, do you want to start now?