

# LISEF Project Listing for North Shore Hebrew Academy High School

Students	Project Title	Project Code	Certified	
Rachel Hanan Jennifer Katz	Genetic and Phenotypic Comparison of Four Arabidopsis thaliana Strains when Exposed to Heavy Metals, for Future Applications in Agriculture	PLNT2642	Certified	<a href="#">Details</a>
Jeremy Noah Bernstein Aaron Michael Baruch Joseph Abraham Masri	Addressing SIDS: Analyzing the Respiratory Rate of Infants Using Image Processing Algorithm	ENBM3780	Certified	<a href="#">Details</a>
Justin Blake Ganjian	The Effect of Microplastics on Tissue Regeneration and the Homeostasis of Dugesia tigrina	ANIM1582	Certified	<a href="#">Details</a>
Jeremy Adam Sofiev	Tackling Food Poisoning: Monitoring Methane Concentration Produced by Spoiled Food Using Arduino Sensors	CHEM1598	Certified	<a href="#">Details</a>
Daniella Azar Ashley Hakakian Leah Samantha Mayeri	A Meta-Analysis to Elucidate the Link Between Tocopherol Acetate and Lung Illnesses of Vape Users	BMED3630	Certified	<a href="#">Details</a>
Ethan Basaleli	A Novel System for Detecting and Mitigating Gas Hazards within the Home	COMP1762	Certified	<a href="#">Details</a>
Ikey Croog	Using RGB Pixel Data to Generate a Stream of True Random Numbers for Encryption	COMP1123	Certified	<a href="#">Details</a>

# Using RGB Pixel Data to Generate a Stream of True Random Numbers for Encryption

(Project ID# 461)

Project Certified  
School

North Shore Hebrew Academy High School

## Adult Sponsor

Lisa Runco

## Category - Subcategory

Robotics and Intelligent Machines AND Embed. Sys. AND Sys. Software(COMP) - Cybersecurity(CYB)

## Project Files

Download Project PDF

Human Subject Consent Form Not Uploaded

## Project Abstract

The encryption that protects important bank and security information currently relies on the generation of random numbers. The mainstream way of generating numbers used in encryption uses pseudo-random number generators (PRNG) and not real random processes of generating random numbers. PRNGs use a specific random number called a "seed" to start the process of generating seemingly random numbers which if it were to be known could allow for the encryption to be broken. True random number generators (TRNG) are an alternative generator that uses random processes such as the noise in audio files or visible light. The data from individual pixels RGB values in a random image can be averaged or multiplied together to give a random number. The algorithm can then move to a pixel mod X of the first pixel. This next pixel's RGB values can also be averaged and then multiplied with the original pixels averaged number. This process can be repeated several times. Although picture TRNGs exist, this algorithm differs. Unlike other picture TRNGs, this algorithm can generate multiple numbers from one picture and not just one number per image. The algorithm is also a cross between a TRNG and a PRNG because the initial image acts as a seed but also is random in its own right. This algorithm is also safer because generating the same numbers would not only require the same image, but also the starting pixel and the mod X by which the algorithm moves by.

## ISEF Form Wizard Used

Yes

## Other Competitions

none

## Will Submit

Form 1  
Form 1A  
Form 1B

**Involves**

none

**Qualified Scientist**

No

**Designated Supervisor**

No

Ikey Croog (User ID# 544)

Student Certified

10th grade, Male, DOB: 12/06/2003, Kosher Lunch, U.S. Citizen  
icroog@nshahs.org, 516-817-4699  
486 Golf Ct., Valley Stream, NY 11581  
North Shore Hebrew Academy High School