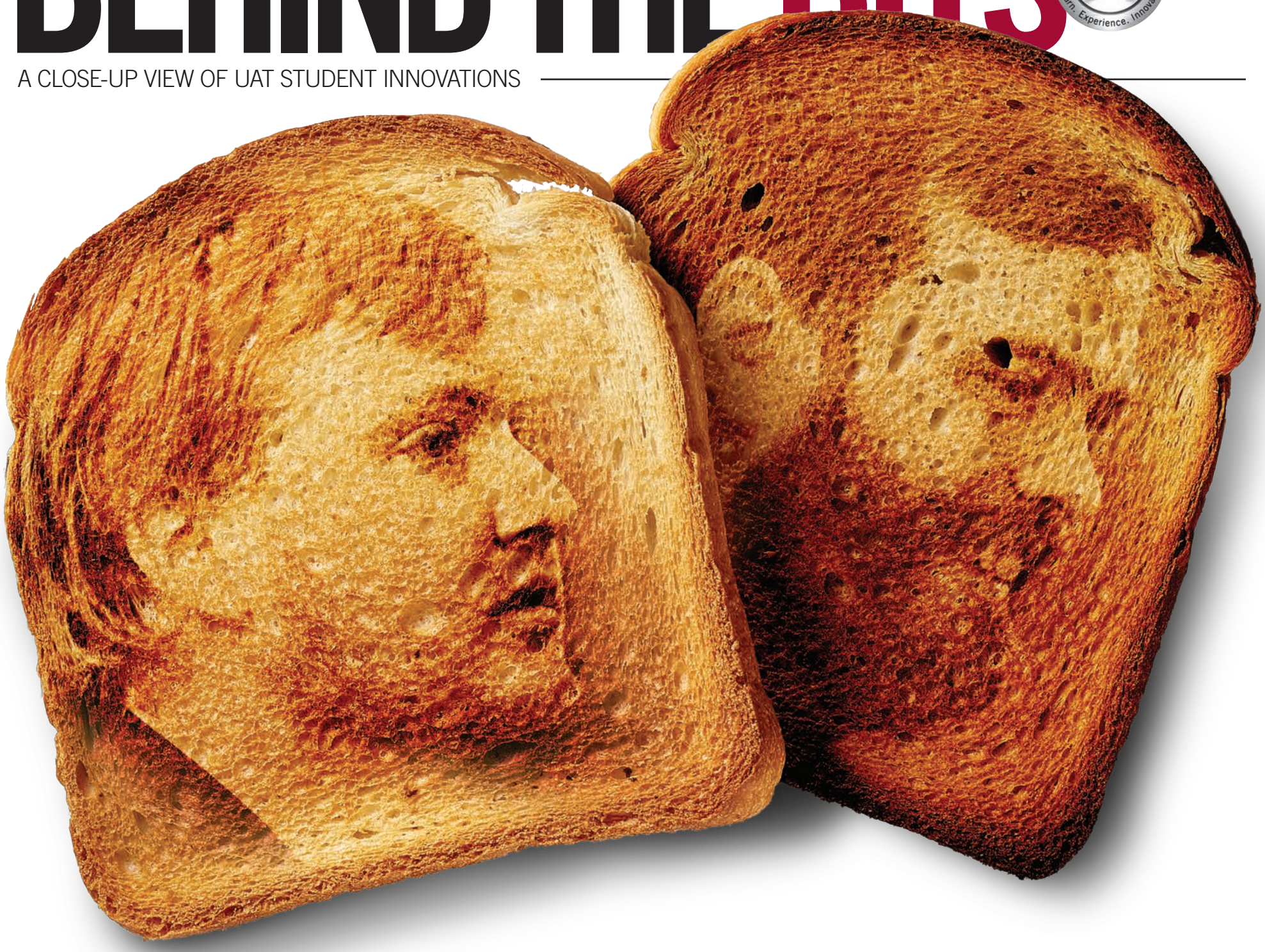
BEHIND THE BITS

A CLOSE-UP VIEW OF UAT STUDENT INNOVATIONS

ISSUE 10



TOASTY SEC FOR POWERSHELL

Adam Morris was working in the Cyber Warfare Range as an intern. One of his responsibilities was to set up accounts for new students and add them to the database, by hand it would take him around an hour and a half to add 40 new students.

Adam and his good friend Kelvin Ashton knew there was a better way to do this tedious and time-consuming administrative work. So, through hunger and a flying toaster screensaver, Toasty Sec, a program script tool kit for network security/system administrators, became their Student Innovation Project (SIP).

Using PowerShell, a task automation and configuration framework, they created features such as adding and deleting users, then moved on to security-oriented commands, mainly hashing files and port scanners.

Every file has a unique identifier, a hash; if you pull up a file and the hash has changed, you want to know why the file has been modified. Toasty Sec can scan the whole disk in a few minutes and hash everything.

Similarly, Toasty Sec has port scanners. Everything on your computer connects to a port, and if there is an unwanted port open, there's an issue on your device. The most common type of web-based attack for web application is a SQL injection; this program addition will catch that if it happens.

Toasty Sec also accesses hardware information. If you want to know what is on the system and what kind of system is running, it will grab and list it.

Adam is graduating with a BS in Network Engineering in addition to Network Security and Technology Forensics with Kelvin. "It's one project that we based around all of our degrees. When we first started this project, we knew that we needed to implement features that would go along with security, so, we took different features that you would use in an actual degree and made it easier and personal," says Kelvin.

Previously, neither knew how to use PowerShell. They took a scripting class to learn basic programming structure, but the difficulty came with learning the different facets of this programming language. Through the use of object-oriented programming, Kelvin figured out how to take one language's methodologies and transfer it to another and learned features on how to make them work together, which was a big key for their SIP.

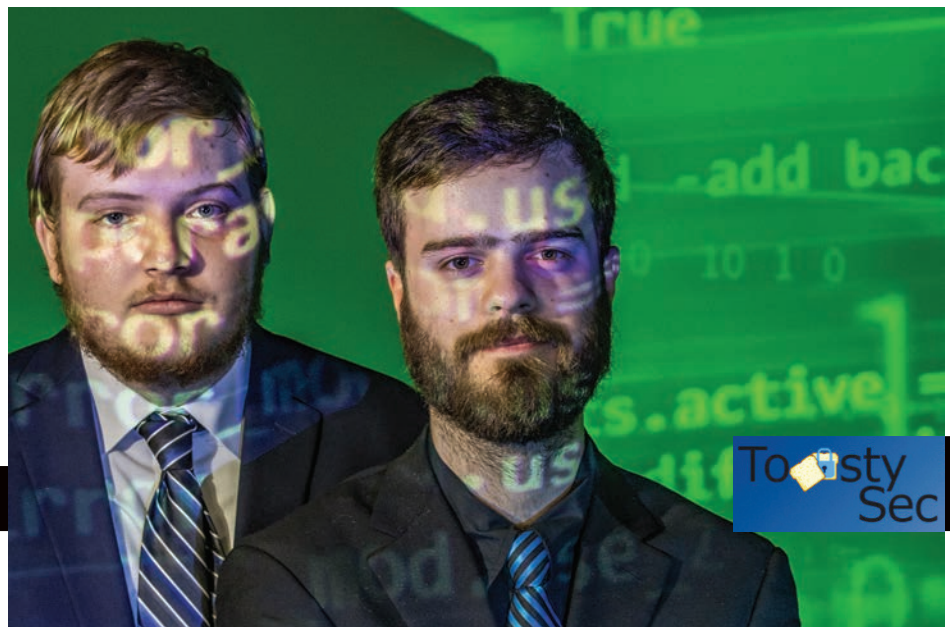
To learn more about UAT's Cyber Security degree programs, check out **uat.edu/BTB/cyber**

TEAM

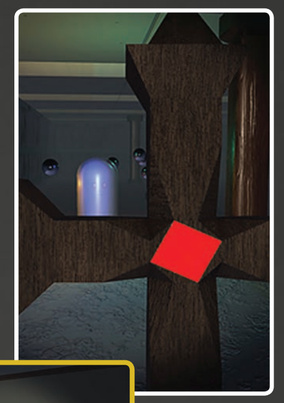
Adam Morris
Network Security, Network Engineering, and Technology Forensics

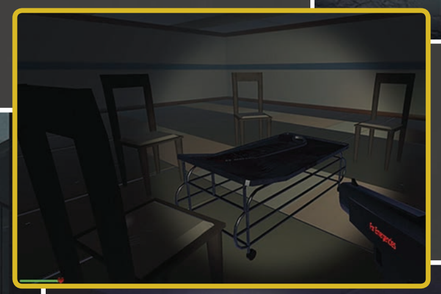
Kelvin Ashton
Network Security and Technology Forensics

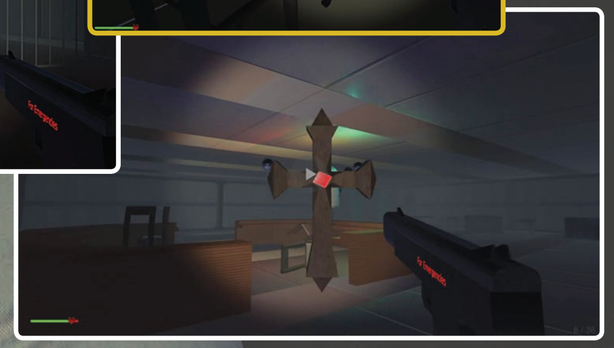
PICTURED LEFT TO RIGHT: ADAM MORRIS, KELVIN ASHTON



LOOTERS OF THE ARCANE







TEAM

Regis Jerry, *Lead Designer*
Game Design

John Wade Miller, *Design*
Game Design

Chance Sweeney, *Design and art*
Game Design

Sarah Baumann, *Design and art*
Game Design

Christifer Nicholas, *Design*
Game Design

Donna Dinh, *Art*
Game Art and Animation

Ian Favreau, *Art*
Game Design

Fred Hunt, *Programming*
Game Programming

Hunter Derrick, *Programming*
Game Programming

Jonathan Moore, *Programming*
Game Programming

Andrew Sweeney, *Programming*
Game Programming

Jessica Johnson, *Prototype art*
Game Art and Animation

Lauren Gasper, *Prototype art*
Game Art and Animation

Jeff Watanabe, *Prototype art*
Game Art and Animation

Dakota Stoner, *Prototype design*
Game Design

Fred Hunt, *Prototype programming*
Game Programming

A TRUE PLAYER VS. ENVIRONMENT EXPERIENCE

In this post-modern survival horror game, players use a Time Sphere to travel to previous eras and find arcane objects for the antiquities company they work for.

This SIP is innovative for its use of True PVE. Coined by creator, Regis Jerry, as an "environment with a personality," the capability of the game's AI gives the player a truly immersive experience. Played in first-person, the player faces challenges presented by the environment as they search for the arcane object.

Interactions between the player and the environment are defined by the level, giving the game a sense of differing personalities depending on the time the player is searching for the arcane object. This gives the player the ability to use the environment to their advantage or let it hinder their game play. Some places players can look forward to fighting in are The Asylum, Ancient Egypt, Feudal Japan, and Ancient Greece.

Through the use of a gun and crosses found in the environment, the player fights off aspects of the environment that tries to kill them. The purpose of finding arcane objects is to sell them to the highest bidder in the future. The objects found are what shaped the current world, giving the game a surreal effect.

Looters of the Arcane will be launched for free on Steam in the spring by Evil Bear Gaming, with the hopes of generating a name for the team of creators.

Learn more about the Digital Maker and Fabrication degree at **uat.edu/BTB/DMF**

HOLOGRAM TABLE

PUTTING TECHNOLOGY INTO FURNITURE

Holograms used to just be cool special effects seen in movies, but now they can be utilized everywhere, including in furniture.

Daryl Garcia (Digital Maker and Fabrication) likes to build, problem solve, and work with his hands to integrate leading tech into unique furniture pieces. For his Student Innovation Project (SIP), he was inspired to create the Hologram Table.

Daryl had built a smaller five-inch version of this and a hologram lantern in the past, which gave him the idea. Using a spare TV, he built a frame around it and used a 3D printer for the brackets to hold the TV in place.

The TV plays the image, creates the projection, which is run through a Raspberry Pi, the actual system that converts the image into a hologram.

Since a TV already has speakers built in, the table is able to play music in sync with the images. Anything with a HDMI port can be plugged into the TV, making video and image options endless.

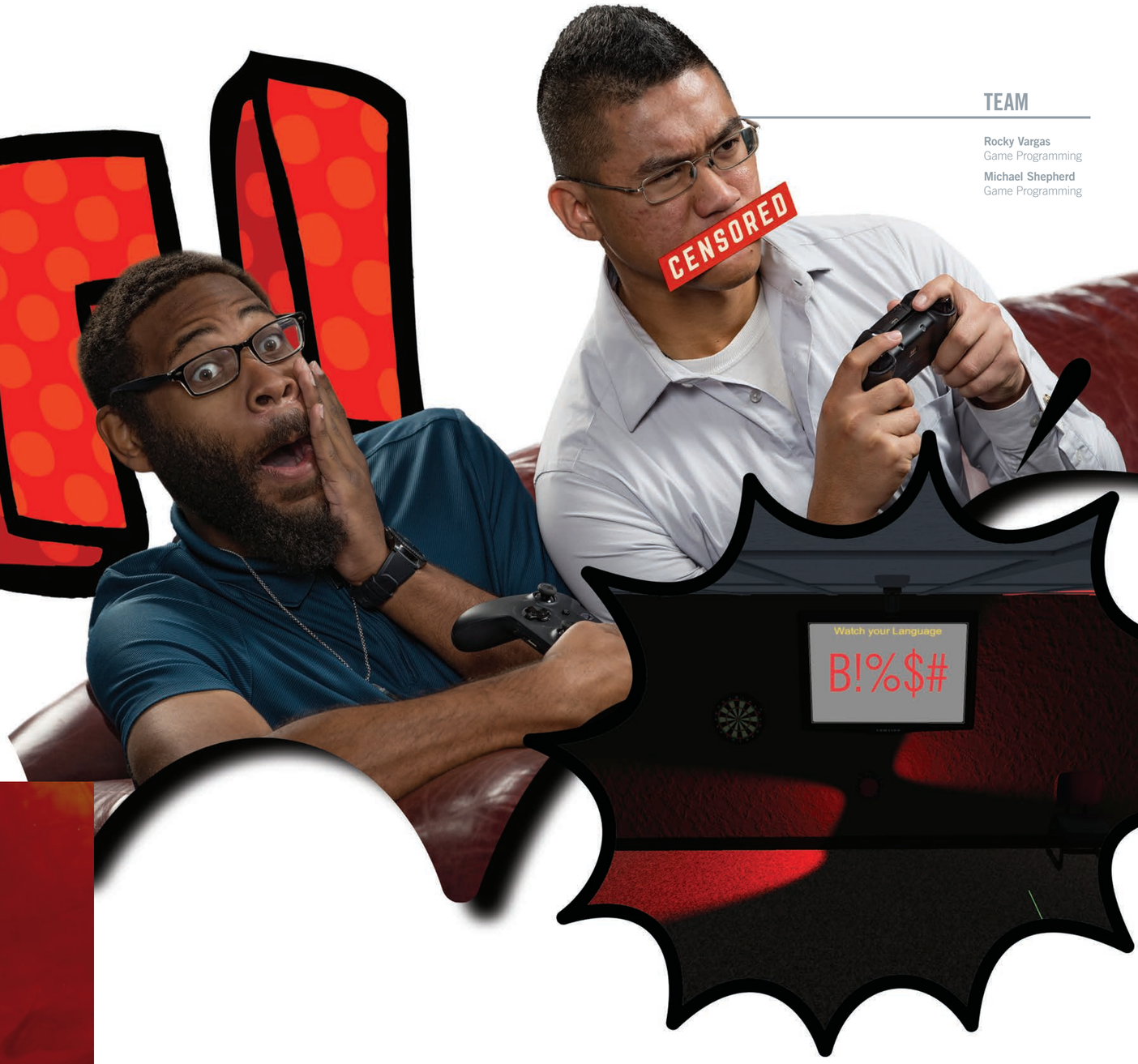
Daryl notes that any image with a lot of movement to it, like fireworks, looks the best and are the coolest to watch, albeit being hard to shoot with a camera.

This SIP has given way to other hologram-inspired furniture pieces. “It would be cool to make a dining room table and make it [the hologram] rise up out of it,” Daryl states, “I’m working on another project where I’m trying to build a smart mirror. I’m trying to get the program site working, but I have the mirror portion done.”

TEAM

Daryl Garcia
Digital Maker and Fabrication

S#!T!



TEAM

Rocky Vargas
Game Programming

Michael Shepherd
Game Programming

WATCH YOUR LANGUAGE!

Have you ever jumped onto one of your favorite game servers and the chat is filled with curse word after curse word? *Watch Your Language* is the new tool to solve that.

This SIP project monitors what players are saying and flags words deemed inappropriate, with the intent of warning the player to watch their language. Rocky Vargas (Game Programming) explains, “Our innovation claim is that gameplay is intensified by turning the foul language gamers use into a mechanic for punishment.”

Currently, there are no games that use speech recognition this way. This mechanic will detect the foul words, alarms go off and the display monitor will show the word. It’s actively monitoring and provides the code for the element that’s purposed for any specific word.

Better yet, this technology doesn’t have to be limited to gamers. Concepts for software, or anything that has code, can be applied anywhere there is a microphone. This idea translates to users having the ability to enter whatever words they wish to omit/punish.

Rocky created the original code to start detecting words and made the streaming portion completely active, while Michael polished the code and hooked everything up, including the sirens and alarms.

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THE INNOVATION FORCE IS WITH YOU

It's here, at UAT, that your passion for advancing technology is fueled by top faculty and technology resources. Student Innovation Projects (SIP) are a state school's equivalent to a master's thesis and become the leading projects in each student's portfolio when they graduate and enter the workforce. Only at UAT will you find this exceptional focus on advancing technology curriculum that offers the resources to innovate. Learn more about the empowering force of UAT student innovation at **uat.edu/BTB/SIP.**

ENDORSEMENT I CONTAINER I SEQUENCE

BARCODE

ISSUE 10

BEHIND THE BITS

TEAM

Gabe Vigil, *Lead*
Digital Video

Andrew Aguirre
Digital Video

BETTERKEYER FOR NUKE

You've seen visual effects, but do you know how they're made? Applications like Nuke, a digital visual effect and compositing application used in post-production, makes green screen filming possible. Nuke gives users a cutting-edge toolkit for node-based compositing and editing. Everything that's done in front of a green screen comes to life in Nuke.

While the program is flexible and collaborative, Gabe Vigil (Digital Video) saw where certain channel keys could be improved to make green and blue screen editing easier.

Once a key is pulled, alpha and RGB channels link, which makes it difficult to control them individually. This results in interference and sacrificing each to settle somewhere in the middle. Gabe's BetterKeyer splits up the alpha and RGB channels so that you can manipulate them independently of one another.

The keying gizmo was developed by building out an entire node graph, which was made up of several different nodes that have to be plugged in a specific way, and then selecting them together as one group. Gabe then went through and selected which specific attribute controls he wanted added for the gizmo.

"One of the challenges I had was trying to foresee what users might want to have access to. I didn't want to have too much and make it bogged down with a bunch of controls, half of which don't really matter. And I didn't want it to have too limited control and not be useful," Gabe says.

Once the controls were in place, organized and labeled, Gabe exported it as a gizmo file onto his desktop and that's what users are able to install onto their own machines.

Through the utilization of the website Nukepedia, users can upload and download gizmos from other Nuke users for free, which is where you can find BetterKeyer. Gabe also recorded a tutorial to show the layout and how it can be implemented into video editing.

Gabe developed the gizmo but had help on the side with shooting green screen plates and volunteer subjects.

Learn more about the future of digital video and the degree that leads the way.
uat.edu/BTB/DV