

# BEHIND THE BITS

A CLOSE-UP VIEW OF UAT STUDENT WORKS

ISSUE



ONE

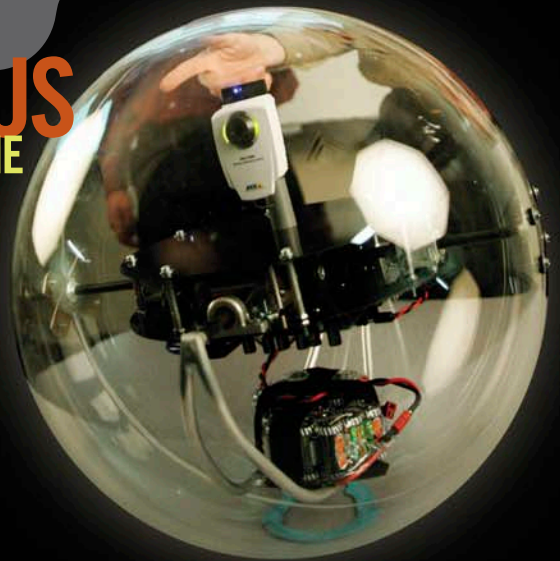


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OF PIRATE MANIA



## The University of Advancing Technology offers students a well-rounded education in a non-traditional setting.

Because of UAT's dedication to both scholastic excellence and technological innovation, it stands apart in academia as an ideal destination for those proud to be called "geeks." A key part of that education is the graduation requirement to complete a formal, sophisticated portfolio of work that demonstrates each student's mastery of the knowledge and skills in their chosen field.

At UAT, students are encouraged to work together in teams to complete complex works that may be used to enhance their portfolios and learn the arts of teamwork, organization, self-discipline and project management. Whether part of a course, or an internship in industry, or completely extra-curricular, these projects are always interesting and many have the potential for future application and commercial development in the real world.

The "advancing" part of "advancing technology" is at the core of what our university, student body and faculty are all about. That spirit and concept of constantly innovative thinking are a key part of who we are as an organization. More often than you would imagine, a late night random thought by one or a group of UAT students launches a "maybe crazy/maybe make a million dollars" technology project that will devour hundreds of student-hours and attract more participants along the way. With minimal budgets, student groups throw time as well as mental and emotional energy at the challenges they face in completing their projects. In addition to coming up with their basic concept, students demonstrate further innovation with novel, low-cost solutions and work-arounds in order to bring their project to life on a shoestring.

In addition to enhancing the portfolio they need to graduate, student projects can also serve as impressive interview support to help them win that job of their dreams after graduation. It all comes full circle with UAT's vision to enrich societal advancement by cultivating thinking innovators for our technology-driven world.

Whether it's a game, a robot, a movie, or a new way to secure information networks, UAT student projects never fail to fascinate and sometimes make a new contribution to the progress of advancing technology. **Here, for your enlightenment, are feature stories on some of the most recent projects to rock the tech world.**

MARKOETZMOTUS  
DOWN  
THE  
ROAD  
TO  
WAR

# COR

THE REVOLUTION HAS BEGUN



## COR Project

## Overview:

Counter Organic Revolution, or COR, is a fast-paced, multiplayer combat game based on the premise of shape-changing machines, or Cybernetic-Morphing Robots (CMR). Originally developed as a student project at the University of Advancing Technology (UAT), it's a total conversion mod for Unreal Tournament 2004 (UT 2004) based on the premise of transforming robots. Assuming the role of a unique CMR, players find themselves caught in the middle of a mechanical revolution. The COR faction, which once served as mankind's resource-mining slaves, have cut off all contact with their human rulers, and are now being invaded by an army of militarily-superior CMRs. The Great Human Council will stop at nothing to thwart the COR's uprising. Gameplay in COR is very fast-paced and team-oriented, including a capture the flag mode, team death-match mode, and the revolutionary Linear Multiplayer Progression mode. Players learn to utilize both forms of their CMR as well as learning to utilize their teammate's capabilities. COR is a feverishly-intense game that is every bit as dynamic as the transforming CMRs themselves.

## History:

Four years ago, a group of UAT students decided to take their love of Transformers, Gundam and other giant-robot manga and anime, and combine it with modern first-person shooter (FPS) Unreal Tournament 2004. The resulting game has taken UAT and the online FPS community by storm.

Their game, COR, harkens back to the imaginative sci-fi characters of mecha with the mechanics of the first-person shooters of today. The team, primarily composed of UAT students, designed this total conversion of Unreal Tournament 2004.

The game progressed to the planning stages in December 2003 and began development in September of 2004. In between the path to completion was a series of presentations at GDC, several interviews—including one with PC Gamer UK—and eager interest online and on their website ([www.corproject.com](http://www.corproject.com)), which received one million hits in the first five months of 2005. An estimated 6,000 people have downloaded the trailer.

COR was inspired by Japanese robot manga and anime and FPS's, as well as games from other genres. But toys and comics weren't the only pieces of insight; everything from medieval armor to diagrams of modern artillery was fair game. While primarily a team-based first-person shooter, elements from adventure, driving, flight and even fighting games make an appearance in some form. There is a maximum of 24 players per game—12 on each side. It's a guess as to how many people will play the game, but with the website activity COR Programmer, Nick Herring, is hoping for 2,000 involved players.

The game is about giant, transforming robots. Depending on the character you choose, you can transform into anything from a helicopter to an immobile artillery cannon. The game has two distinct factions and several modes of play. Characters can... tell you what, just check out [www.corproject.com](http://www.corproject.com) and read it for yourself. Go ahead, I'll wait. Did you read it all? That's a lot of stuff, but the COR team remains confident that they can and will do this all successfully. Why will they succeed where so many others have failed? Planning and communication.

We asked the team about their experience. Here's what they had to say:

## What is the ultimate goal for the game? How many levels, characters, and maps were you aiming for?

Our goals for COR's content were ambitious, but also achievable. We're currently planning for eight transforming characters with unique vehicles and special abilities, in addition to at least seven different maps. We plan on having 8-10 choices of flashy energy weapons.

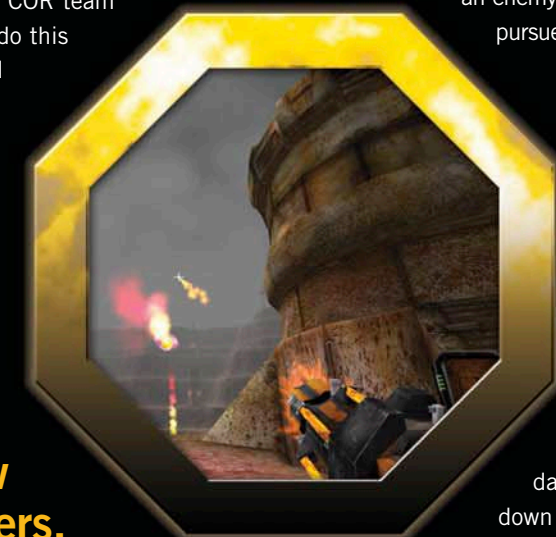
Additionally, COR will have a dual weapon and load-out system, so if you love carrying two guns, this mod is for you. If that's not quite for you, the close-quarters combo system we're designing might be just right. The mod also introduces a new heat system, where various activities cause a player's "heat" to increase. If their heat meter reaches a certain level, they'll self-destruct. Yes, overheating does produce a neat explosion; you'll have to play COR to see for yourself.

## Can you describe the game concept and the user experience that you were aiming for?

Our goal was for fast-paced and highly intense battles, spanning over our many exotic locations on Tantalus IX, the COR world. After a player spawns in their base, they grab their previously selected weapons from the load-out pad and then jump into the fray. Players can choose to transform into their vehicle forms and attack the enemy base, or choose to take up a defensive position and preemptively strike incoming enemy vehicles with their heavy-duty, dual-arm firepower.

A substantial amount of the action will take place in large, outdoor environments where players must use the terrain to gain the advantage, whether by surprising an enemy from behind or evading pursuers during reconnaissance.

The Cyber-Morphing Robot's shields absorb the damage a player takes by incoming gunfire. However, the energy is transferred into heat. If a player overheats, their shields will drop and they will be vulnerable to permanent hull damage and can even melt down if they continue to expose themselves to heat.



## STAGES OF COR

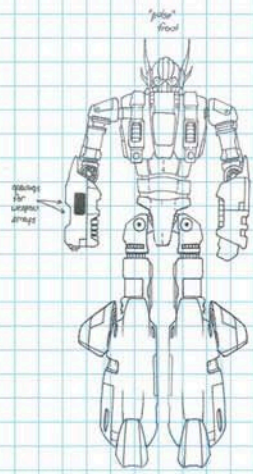


Figure 1:

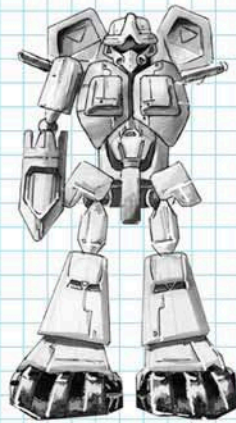


Figure 2:

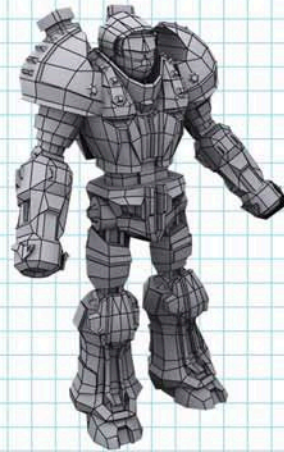


Figure 3:

### Evolution of COR Project Character, Scorch.

## THE AFTERMATH

### What sort of tools are you using?

Unreal Editor and Unreal Script on the programming side, 3D Studio Max and Photoshop for the artists. One of our level designers also uses Lightwave 3D, and Subversion is used for managing code changes.

### What kind of advice would you give to any students who are considering a project similar to COR?

Even though paperwork and planning might be what is the furthest from your mind, it's the most important thing you can do for your mod. Yes, it's boring, it's tedious, and takes up more time than it should, but to forgo documentation is as misguided as forming a mod team

without programmers and artists. Before the first line of code or the first concept art piece, sit down and plan what you're going to do, when you're going to do it, and who's going to do it. Not only do you need to plan this - you need to write it down. Documenting what you decide is all that will keep your project moving half way through the semester when you are wondering if you're on track.

In addition to this, make sure every member of the mod team is completely committed to the project. Plenty of mods have suffered or failed by completely relying on team members who were not willing or able to do their part. On a mod team, every member has a vital role in completing the project.

### Challenges: Your game group is part UAT and part non-UAT students. What are the challenges and advantages of a mixed game group like that?

COR is not being run as if it were a traditional UAT mod-class, but rather, as a self-motivated team that is developing a product. In order for a mod project to be successful, it should be more than just a class. What matters more than attending the same school is that a team member is talented and willing to work. Even though a substantial amount of extra effort must go into maintaining the relationships with those who are not UAT students, in the end, having a strong team is well worth it.

### What are the unique programming challenges of this Unreal Tournament mod? And what were the solutions?

The challenge with a mod is always working with the existing technology, staying within its limits, and accentuating its strengths. Unreal is very unique in that it's extremely flexible, and its overall design is meant to be extremely accommodating for mods. On the other hand, quite a bit of the engine is "native," or locked away from us, so we have to work around this barrier in order to achieve our many programming goals. Unreal's substantial amount of documentation has been the single most helpful thing whenever we encounter problems.

### What are the unique design challenges of creating the transformer characters? And what were the solutions?

The greatest challenge presented to the artists was that of designing fully transforming characters on paper, and realizing them in 3D. Much research went into perfecting the beautiful in-game transformations. We implemented transforming by creating three models of each character, all optimized and rigged for their specific purposes. Transform models contain all the back-faces and complex rigging necessary for transforming, while character models are optimized to the humanoid-form of the character and are rigged with biped for character animation. Vehicle models are optimized and rigged for motion and effects. When a player transforms in game, the models swap seamlessly between these three completely different models. The transform system is just one of the many COR-specific challenges that are met through the close collaboration between artists and coders.

### Successes:

A lot of work has gone into the game, and just as much work—if not more—has been put into promoting it. At GDC in San Francisco in 2005, the COR Project team presented their work to show goers and industry developers behind closed doors. The COR website has garnered widespread attention for the game and its budding legion of fans. Buzz from the online community has led to several interviews regarding the game's progress. And several industry vets are intrigued about the finished product.

With the release of the game, this collection of UAT game creators will do what few at the school have done: release a polished game that can stand with industry-made games. The COR Project team might have made something fun to play, but they also have a game that others outside of the school will want to try as well. COR will put UAT on the map as a game-making force, and all because of the love of giant robots.

### The Future:

The team learned two of the most basic and essential lessons while in development of COR. Planning and communication are the most difficult and time-consuming aspects of a project. They discovered how important the planning put into the mod really was, and also the challenges of keeping the team communicating and motivated. The ultimate goal for the team lies in finding creative ways to encourage ongoing communication.



## Participants:

A majority of the COR Project team are members of the UAT community

## COR Project Team:

### Leads:

Chris Pope – Lead Artist, Lead Designer,  
Project Lead UAT  
Matthew Tonks – Lead Programmer, Project  
Lead UAT

### Artists:

Jason Reiss – Modeler/Texture Artist UAT  
Nate LaMartina – Modeler/Texture Artist  
UAT  
Holly Meyer – Modeler/Texture Artist UAT  
Toren Lehrman – Weapon Animator/2D  
Artist UAT  
Andy DeGroff – Character Animator UAT  
Joe Baker – Weapon Design (Concept) UAT  
Paul Ziomek – Character Design (Concept)

### Level Designers:

Tam Lee – Level Designer  
Jay Elwanger – Level Designer UAT

### Sound:

Sean DeVries – Sound Engineer  
James Hemsing – Sound Engineer  
Nick LaMartina – Sound Engineer

### Programmers:

Timothy Talley – Programmer UAT  
Nick Herring – PR and Programming UAT  
Nikki Graham – Community Representative,  
Writer UAT



## Where are they now?

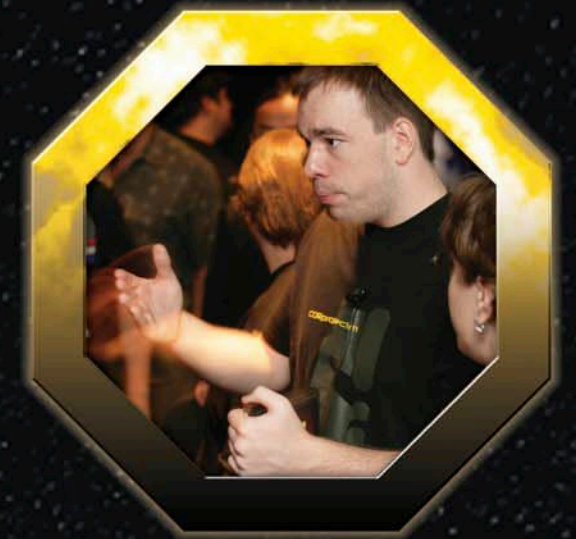
Within six months after its initial release, COR has served as a career catalyst for 8 members of the team who found employment in the gaming industry after graduation. At the 2006 Tech Forum on campus, three COR team members returned to UAT to talk about COR and their new real-world jobs.

### Nick Herring

Nick Herring, programming lead on COR, is now a lead programmer managing a research and development team for Atlantic Cyberspace (ACI). Nick's team develops technologies to train infantry troops through simulations, virtual reality and Unreal technologies. Nick enjoys the management of agile team development and credits UAT for providing him an opportunity to participate in industry-like development projects. Nick said, "It's unusual for someone who's just graduated to be leading a team, but my UAT experience made that a real possibility. It allowed me to see challenges clearly, articulate solutions and take initiative." If you're not jealous enough, Nick's office is in Hawaii.

### Chris Pope

A spring 2005 UAT grad, Chris Pope is now a production artist with Red Storm Entertainment in Raleigh, North Carolina. Chris works on object and environmental art and his credits include Ubisoft's widely anticipated Tom Clancy's Ghost Recon: Advanced Warfighter for Xbox 360 and the DLC expansion pack on Xbox Live. Prior to attending UAT, Chris was an artist developing various government applications which leveraged the power of cutting-edge video game engines at Los Alamos National Laboratory. Chris feels that the outstanding networking opportunities available at UAT were the keys that allowed him to get a great job so quickly after graduation.

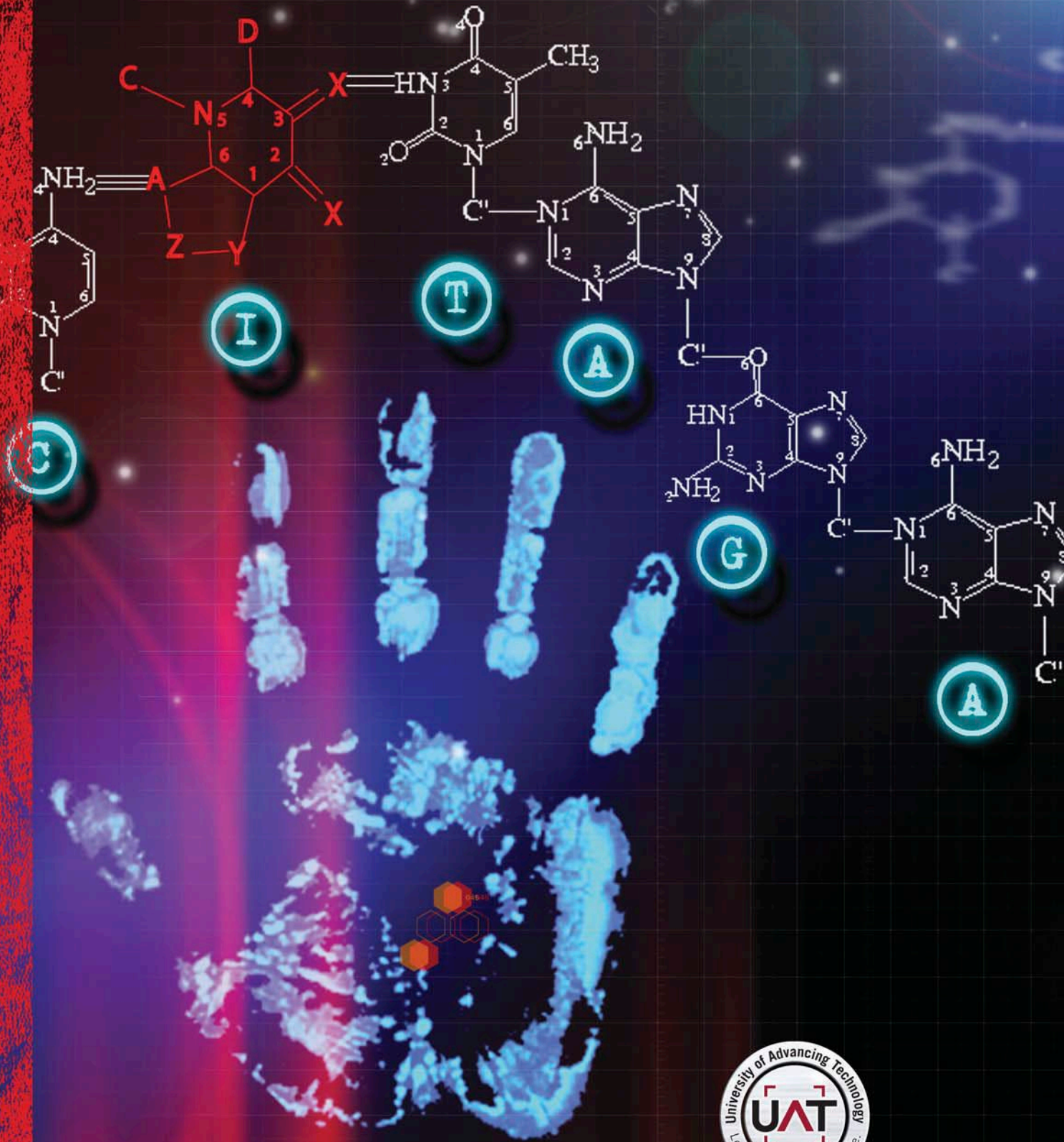
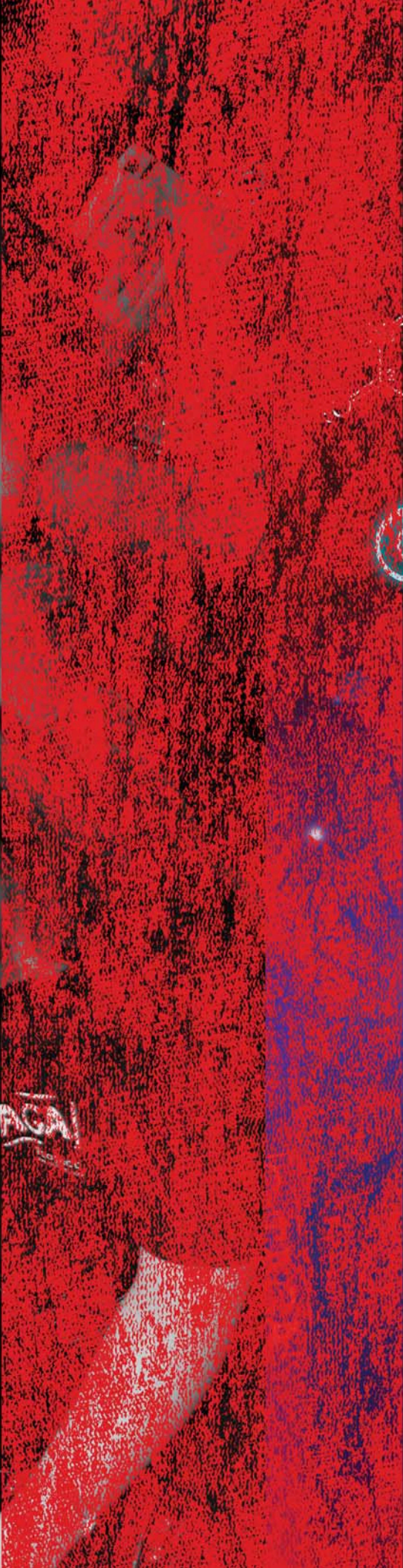


### Matt Tonks

Currently working on artificial intelligence as a software engineer on Medal of Honor: Airborne at Electronic Arts (EA) in Los Angeles, Matt Tonks began before graduation as an intern there in the summer of 2005. Along with Chris Pope, Matt co-founded and managed the COR project, which led directly to his first interview with EA. When Matt originally transferred from the University of New Mexico to UAT, his main expectation was to beef up his programming expertise in order to get into the gaming industry. But, as Matt says, "The technology is one thing – it's a given – you have to have it. What I really got from UAT that put me ahead of other candidates for an internship is the real world experience of conceiving a project and then carrying it through to completion with a team of peers. The team and time management experience I acquired as one of the leaders of the COR project allowed me to start fast at EA and impress people with my skills."



# USKADOE-TNMOCTUS



The **CITAGA!** Project

# Overview

The CiTAGA Project (short for Cytosine Unidentified Nucleotide Thymine Adenine Guanine Adenine, though not an acronym) is a student project Unreal Tournament 2004-based first-person shooter/team-based online role-playing game. In the works for about a year, some of the mod's ideas began life in another mod named Branching Fate.

The legendary Roswell alien crash of 1947: the alleged military cover-up, the rumored alien autopsy and the horrifying movies it spawned (hello, Independence Day!) have people talking about it almost 60 years later. But what if the events were true? And what if the government used this information for their own purposes?

The player assumes the role of the Alien/Human Hybrid soldier or a member of the Omega Battalion and embarks upon team missions to overtake installments and achieve objectives, both in a branching storyline.

The CiTAGA Project includes elements from the RPG and FPS genres for a more character-based experience, lacking only a persistent world from being considered a true MMO. "It's a really different type of first-person shooter game. In the end, you're playing a first-person game, but you're playing with all these different elements," Level Designer Cliff Lasana said. "We really want it to be a very different, very interesting experience for the players. It's not a cookie-cutter first-person shooter experience just to show that it can be done."

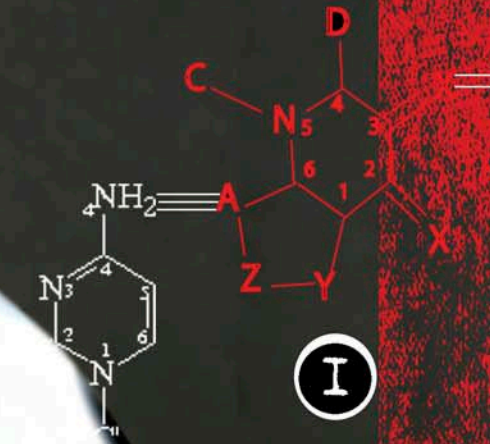
# Details

## Why create this game?

The market has yet to see an FPS MOD that encompasses the complete immersion, or close to it, of a player into the game. The same can be said for changing elements to reflect the "Tides of War."

## What is the main focus?

The two main goals, depending on what side the player takes. One is to achieve freedom for the Hybrids, while overtaking installations and killing government agents in a bloody coup that turns into a full scale Civil War, the other is to try to squash and exterminate the threat of the uprising and its effects by siding with the government.



The  
**CITAGA**  
Project



### What is different about this mod?

What makes this MOD different is that it uses equal parts visual and audio signals to allow the player to experience the "Tides of War" first hand.

"The terrain will yield a slight tactical advantage, team theme songs will come on, and certain emitters will activate, so the environment is going to change a little here and there," Project Lead Steve Merka said. "It actually makes it tougher for the person that's losing to get back on top, so it creates more of a challenge and more re-playability. But not to the point where the players on the losing team will throw aside their mice and want to quit the game."

The story for CiTAGA is comprehensive for a FPS. Starting in 1947 in Corona, N.M., the military recovered a battered alien spaceship and two humanoid aliens, taking them to their Roswell facilities. While treating the surviving alien, the scientists created a rough form of communication, with the alien imparting knowledge of their technology in exchange for the scientists repairing the spaceship to return home. Alas, the alien never made it home.

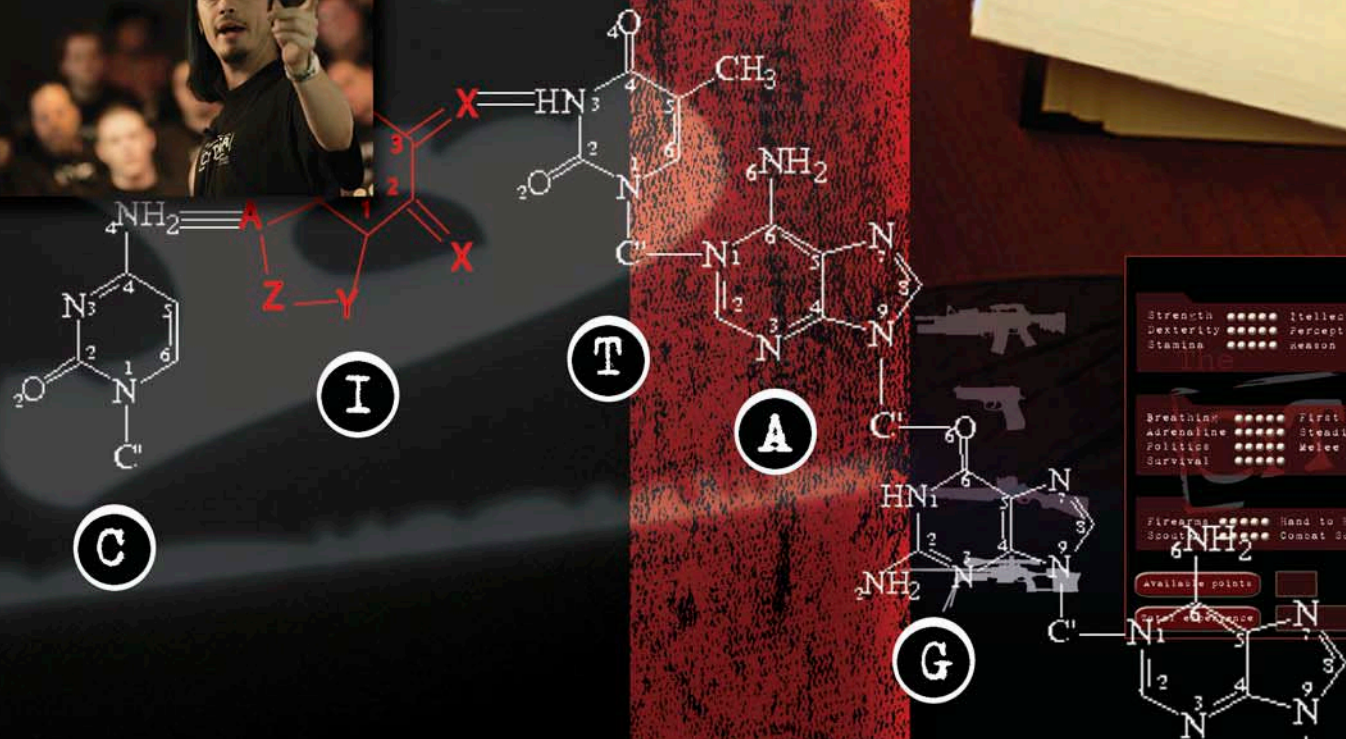
The two warring factions are the Hybrids (an alien-human experimental group or the hopes of the "Super Soldier") and the Omega battalion, operators of the Hybrid facilitation. "You can mess with their communications; you can scramble their communications; the other team can't communicate with each other; you can hack into its network and you can see what they're saying," Lasana said. "At the same time, you're trying to encrypt yours so they can't intercept."

## Details

## Challenges

According to Steve Merka, "This was truly a 'hey, kids let's create a game' kind of experience. Some students got involved so early in their UAT career that they didn't even know what a 'game mod' was yet. I would always tell them, 'Oh, good. You are going to get a quick education!' Our faculty advisor, Ron Floyd, who has worked in the game industry, took a pretty much 'hands off' approach. It was a little odd at first, but it gave us the room we needed to learn how to solve challenges quickly in a team environment."

Marcial White, part of the network programming team, got involved even though his major and expertise is in network security. It's an example of non-traditional team members helping in non-traditional ways. "Get people that don't work in games, because they give you such a perspective that you don't know, that you don't look at," said Merka. "Marcial's proof-positive."



Strength *****	Intellect *****	Charisma *****
Dexterity *****	Perception *****	Manipulation *****
Stamina *****	Reason *****	

Breathin *****	First Aid *****	Computers *****
Adrenalin *****	Stendices *****	Leadership *****
Politics *****	Wlee *****	Stealth *****
Survival *****		

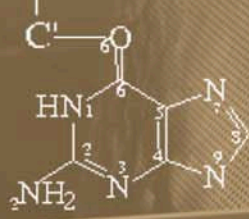
  

Firearm *****	Hand to Hand *****	Hacking *****
Sports *****	Combat Dervery *****	Armor *****

Available points:

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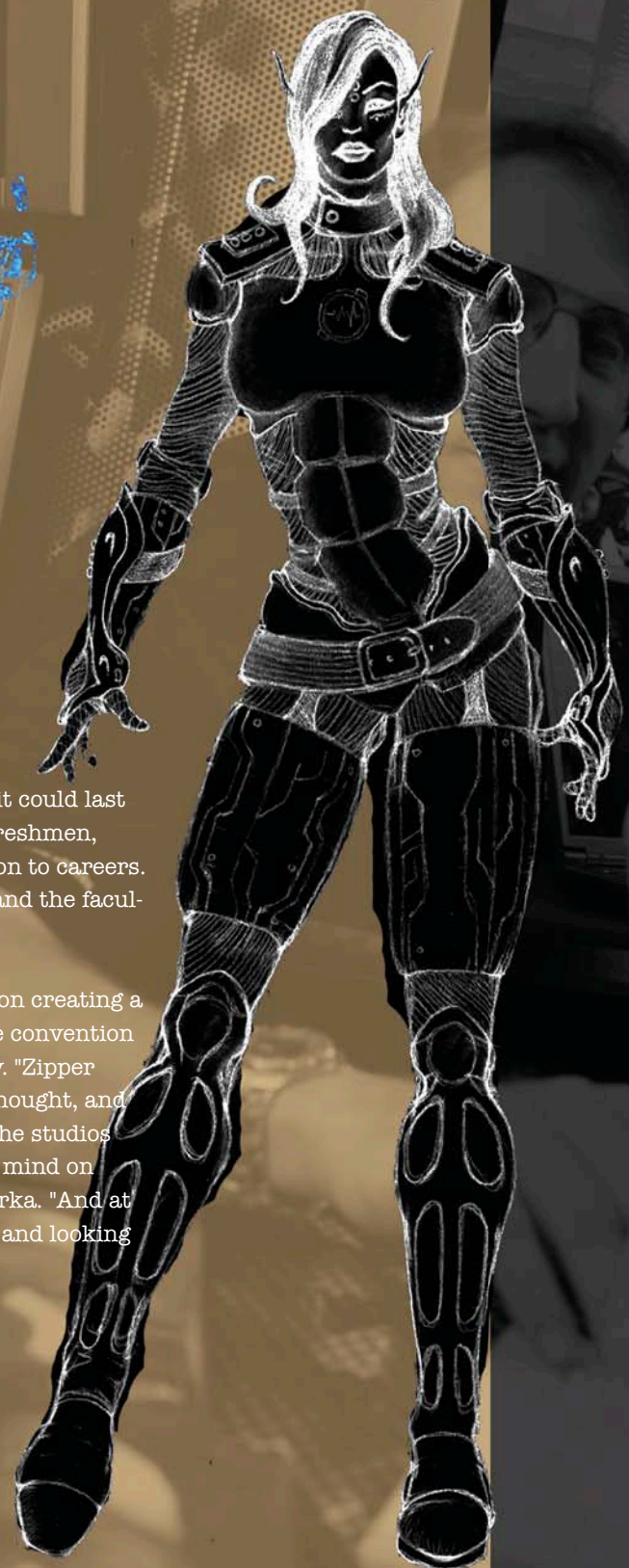


**G** **Successes**

Steve Merka reports that, "Some project participants have gotten very interested inquiries from companies in the game industry by using this mod as a portfolio piece in interviews."

Jered Brown, a member of the Story Documentation team, said, "As a film student, I came into the project with no game design or programming experience. The project gave me a whole new perspective on gaming and it has lead to the development of new skills on my part." Another film student who worked on CiTAGA, Carlos Chavez, is now producing a documentary on the project.

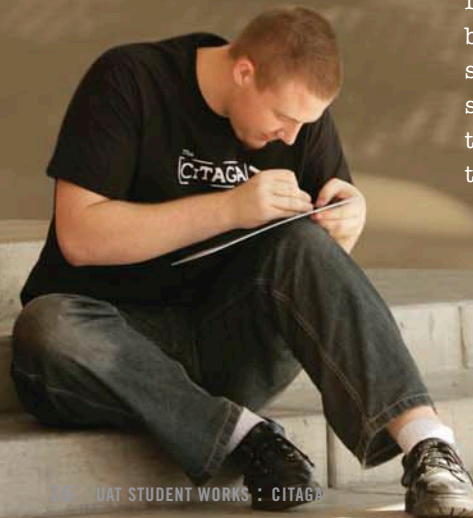
"The combination of an RPG and FPS has been considered the Holy Grail of games - it's hard to deny it. I'm not saying we'll be able to do it in the ultimate, successful way, but we're trying," Merka said. "And what I want [the player] to come away with is, 'Wow, what a combination. This really worked.' We're trying to push what the industry has and take it just a step further to show that our school and our motto is, 'Three years ahead of the curve.'"



**The Future**

"This project may never be finished," said Steve Merka, "it could last for years and keep evolving, with new people, including freshmen, joining as previous project members graduate and move on to careers. It's a way to give a little back to the school, the students and the faculty. It will keep going on."

Feedback from the GDC meetings honed the team's focus on creating a polished product. Additional comments received after the convention assured the team of their progress and the game's quality. "Zipper Interactive wrote this enormous email about what they thought, and basically the guy said, 'I've been talking to everybody at the studios since I came back, and I think I've started changing their mind on student projects,' which was really encouraging," said Merka. "And at the end of the email, he asked if anybody was graduating and looking to get started in the industry."



**Leads**  
 Project Lead: Steve Merka  
 Art Lead: Andrea Cosgrove  
 Lead Level Designer: Cliff Lasana  
 Programming Lead: Robert Shields

**2D Art, Print, and Design**  
 Josh Gertz

**Concept Art Team**  
 Ali Lasana  
 Brian Nygaard

**Modeling Team**  
 Erin Ali  
 Adam Benson  
 Nate Cox  
 Corey Embrings  
 Heather Grice  
 Doug Kavanagh  
 Tristan Sextant  
 Wade Thomas

**Level Design Team**  
 Matt Dondelinger

**Programming Team**  
 Andrew Hawken  
 Randall Wolgast

**Animation Team**  
 Trent Kollodge

**Sound Team**  
 Carlos Chavez

**Music Team**  
 Terminal 11

**Texture Team**  
 Jeff Addonizio  
 Alina Minisce

**Network Programming Team**  
 Marcial White

**Story Documentation Team**  
 Jered Brown

**Public Relations**  
 Nate Chavie

**Web Team**  
 Ken Walker

**Faculty Advisor**  
 Ron Floyd

**Former Team Members**  
 Programmer: Tim Talley

Tides of War Technology  
 Macro

**Branching Storyline:** Offers multiple endings based upon the progression of each team concerning maps won. Each map is based upon the outcome of the previous map.

**Micro Instant Changes:** Provides instant feedback to denote winning team. Feedback includes change in music, surroundings, emitters, textures, and movers.

**RPG Style Character Building Stats are vital and important to the player.**  
 Attributes: Physical, social, and mental

**Abilities:** Skills  
 Feats: Combination of attributes and abilities  
 Ranks with Auras

**Team-based Design Gameplay**

**Multiplayer Features**  
 Play as one of four characters

Massive multiplayer battles with up to 32 players at a time

Objective: based multiplayer missions

Traditional Deathmatch and new improved Onslaught: based maps.

**Features**



UNKROEHNMOCHIS

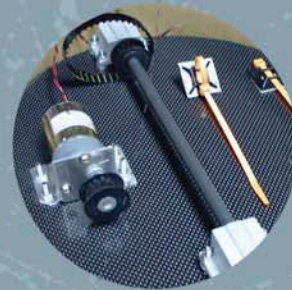
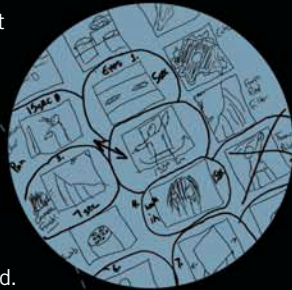
# ICARUS

INTERNET  
CONTROLLED  
ALL-PURPOSE  
RECONNAISSANCE  
UNMANNED  
SPHERE



## overview

ICARUS (Internet Controlled All-purpose Reconnaissance Unmanned Sphere) is a student project for the development of a TCP/IP enabled device at DEFCON in Las Vegas. ICARUS is a hollow sphere containing a microcomputer which will be controlled through a web application over an 802.11 wireless network. The sphere can be controlled from a site on the Internet or locally through a handheld device running Windows CE. The sphere also has an internal video camera which allows the user to see from the sphere's point of view. The technology used in the development of this project could be used to create unmanned Internet-controlled devices and additional functionality, such as gathering sensor data or robotics, can be easily added.



## details

### WHAT DO "SUPER MONKEY BALL" AND AN IP-ENABLED DEVICE HAVE IN COMMON?

Both are the inspiration for ICARUS, the free-roaming machine that allows users to have greater interaction with a webcam than is typical with a stationary device.

The ICARUS project was born during a meeting of DC480, an independent network security oriented group at UAT. During a discussion of the upcoming DEFCON convention (think of it as the light side of hacking), UAT's IT Manager of Development, Ray Blackwood, asked if the group was entering the IP-enabled device contest.

Student Dennis Evans took it from there. *"I went home thinking about it and was playing 'Super Monkey Ball' with my girlfriend when it came to me,"* Evans said. The game, consisting of controlling a monkey trapped in a clear ball, sparked the project forward. *"I brought the idea up to the rest of the group at the next meeting, and everyone seemed to like it,"* said Evans.

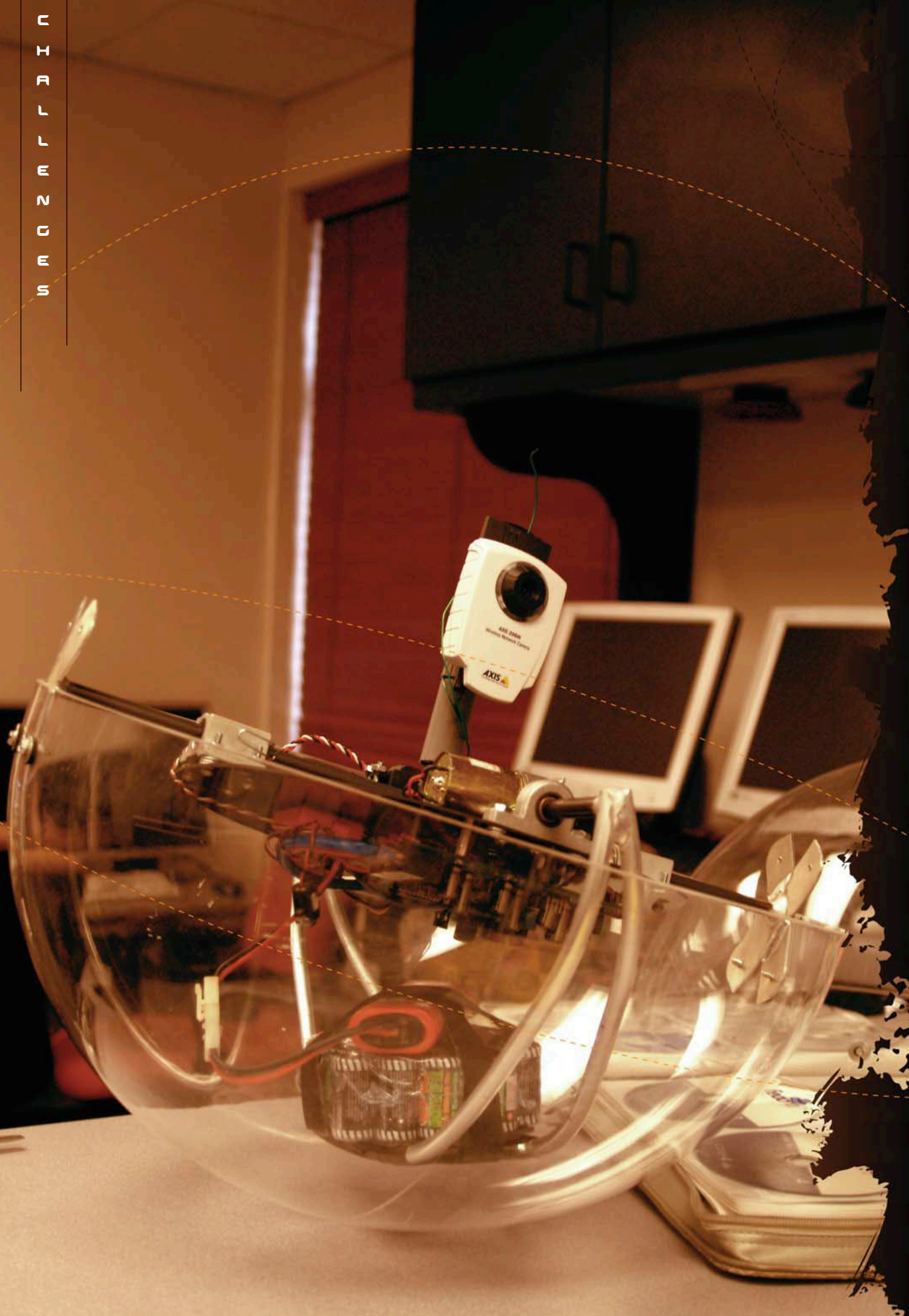
*"With ICARUS being in a remote location, it'll truly show off its ability to be controlled remotely over the Internet,"* Evans said. *"It could be in the same hotel as DEFCON, it could be here at the school or it could be on the east coast in a friend's basement."*

The design process leading to the final plan was comprehensive. The group went through several ideas — with one consisting of a robot in a ball with omni-directional wheels to maneuver — before settling on the current idea, a pendulum as the basis of movement. *"The concept behind the pendulum is to shift the ball's center of gravity around to get it to roll in that particular direction,"* Evans explains.

Using the clear acrylic ball, a drive shaft **[CONTROLLING MOVEMENT]** is affixed through the ball's center. The drive shaft is connected to a platform via wheel bearings. A motor attached to the platform will connect with the drive shaft. A "u-shaped" swing arm (perpendicular to the drive shaft) connects to the platform by wheel bearings. A battery (fixed at the crest of the arm) and servomotor turn the swing arm into a pendulum, swinging left and right. The wireless 802.11 camera is fixed on the swing arm, providing a live video feed. An 802.11 receiver and controller board is placed inside the ball.

Regarding actual movement, **THE PROCESS IS MORE COMPLICATED.** When the user moves the device forward, the motor propels the drive shaft and attempts to lift the battery on the swing arm. Because the battery is being raised, there is less weight on the drive shaft, allowing for the device to move. For turning left and right, the servomotor and the swing arm come into play. The servomotor shifts the pendulum to the left and right. Before the arm swings the weight, the platform and drive shaft tilt in that direction, turning the ball.

While those components aid movement, **THE 802.11 WIRELESS NETWORK IS THE LINK** between the user and the device. An 802.11 receiver within the ball receives user signals and converts them to motor and servomotor voltages. The camera then sends back connectionless packets of live video feed, allowing the user to view and control the ball in near real-time.



## challenges

No project is without its share of problems, and the ICARUS team encountered a few — a big difficulty was scheduling time amidst the busy life of being students.

Another challenge was the lack of parts or proper tools at the earliest stage, so students set out to seek industry support and sponsorship. The key technical challenge to development had to do with the link controlling ICARUS. The 802.11 wireless network presented an interesting challenge for the group to secure — and it presented a hacking target for others.

*“With ICARUS being controlled over an 802.11 wireless network, there is always a risk of control being taken over by an unauthorized user,”* Evans said.

The group does anticipate a remedy to this potential peril soon, however. “When we get to this point of the programming, we will look to install some security measures to prevent unauthorized access,” Evans said.

While ICARUS began as merely an exciting student project, the technology has potential practical applications. “For one, ICARUS can be used for its primary purpose, which is surveillance,” Evans said. “It has the potential to be a roaming security guard that records everything it sees. This won’t necessarily get rid of its human counterpart, as there will need to be someone to control ICARUS and monitor what it sees.”

“We have thought about creating a more beefed up model for racing in a custom-made half-pipe track. With multiple ICARUSes, we could play just about any multiplayer game you could conceive of — like capture the flag, laser tag and many others,” says Evans.

To improve upon the device’s functions, the team needed to create and stick with a functioning model. Quality control and feedback were keys to realizing its many uses.

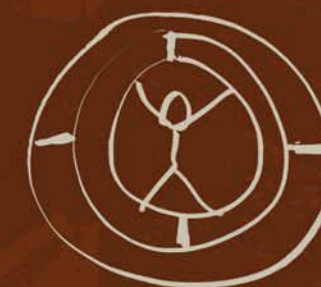
“We didn’t know such things as what the battery life will be like and whether it will actually perform under rigorous conditions,” Evans admits. “So a lot of bugs had to be worked out before we could move forward with its full potential.”

With a heralded appearance at DEFCON and G4 Television, and the feature player at September’s DC480 CON, Project ICARUS was the jewel of UAT’s Net Security Club, but it also caused a lot of burnout.

“After DEFCON, we kind of took a break from it for awhile because, at DEFCON, we spent, I think, a whole night straight just building this one,” Evans said. “So after a night like that, we didn’t think about ICARUS, we didn’t dream

about ICARUS, we didn’t do anything with ICARUS.” While the group envisioned refining ICARUS, plans were for DC480 to move on to projects differing from their robotic sphere. But whispers around campus for ICARUS to appear at Tech Forum sounded the call for a re-emergence of the IP ball.

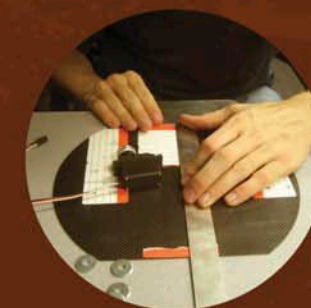
With a re-energized crew and a new goal, DC480 tackled the task at hand. But instead of merely patching up the first model, DC480 decided to scrap it in favor of a newer — and better — ICARUS: version 2.0. “It’s a rebuilt version of the old one; it’s just revamped,” Evans said. After building the first one, the group found the kinks and tried to work them out — a high center of gravity, lack of battery power, a slightly lopsided acrylic sphere, and a faulty servo were problems plaguing the first version. “Basically, everything that’s not the camera, control board, power board and wiring got redone,” Evans said.



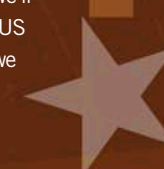
*“Basically, everything that’s not the camera, control board, power board and wiring got redone,”* Evans said.

DC480 took several measures to rectify the mistakes of old, and part of the equation lay in the transparent sphere. The group ordered an 18” polycarbonate ball, which addressed many challenging issues. The added size also allowed more room for longer aluminum rods for the axle and swing arms and two batteries instead of one for more power. “We went with the 18” ball so we could make the center of gravity lower; we put both batteries inside which will increase the pendulum weight; and we’re going to try not to put as much power to the motor — which all of these factors put together should prevent the pendulum from ever spinning over the top of the sphere like it did at DEFCON,” Evans explained.

Other new parts included carbon fiber board and a new servo with metal gears for the pendulum to turn the ball which eliminated stripping of gears. Along with the changes, DC480 decided to alter a few features. A servo left over from the first ICARUS works in tandem with the camera for a new pan feature. Using an analog controller, the right analog stick pans left and right. Another modification involves the ICARUS network. The group switched control of ICARUS from the private Robotics network to UAT’s Tsunami network for a wider range of coverage. “We’ll be able to sit in one spot and drive ICARUS anywhere around the school, as long as we have connectivity,” Evans said.



DEFCON



## participants

The ICARUS group — From L to R back row, Joshua Wisman, Nicholas Nau, Jeremy Leung, Dennis Evans, Daniel Scarbery, Front right corner: Brian Bernstein Project Lead: Raymond Blackwood, UAT IT Manager of Development.

## success

With the tight schedule, DC480 wasn't able to address all the bugs from the first ICARUS. However, the group is satisfied with what they've accomplished thus far. "The time constraints were less than desirable, but we worked around them. I wish we had more time to do some more debugging, but we're getting the major stuff that we needed to address that ended up fixed," Evans said.

The results of DC480's work were shown at Tech Forum in 2006, but don't count out future revisions. As with the original version of ICARUS, the team is looking to improve their reconnaissance sphere. "After this, there'll be more debugging and more working out any kinks that come along until we get something very reliable and very user friendly, to the point that we have it implemented all the time around school for students and people over the Internet to play with," Evans said.

## the future

That potential of ICARUS may be tapped in the near future, but the DC480 group can't guess the future. While primarily a network security group, the club is not ruling out exploring the possibilities of the IP-device. "I think ICARUS has been a project that is kind of out of the scope of the DC480 group," Evans said.

"I'm sure a select few of us will make ICARUS an ongoing project after it's completed, but it's not going to be the focus of DC480, since our goals are more diverse than that." Still, the group's vision, resourcefulness and persistence to bring ICARUS to fruition are impressive nonetheless. Not bad for an idea stemming from a monkey trapped in a ball.



# UNRAVING THE MATHS



*Pirate Booty*  
*and face value*



# PIRATE

According to the 48 Hour Film Project's official history, producer Mark Ruppert dreamed up the challenge of having filmmakers create a movie in 48 hours. Ruppert, fellow producer Liz Langston and other filmmakers in the Washington, D.C. area formed teams and set out to answer the question of whether or not 48 hours was a long enough time to make a decent film. Apparently, it was. By 2006, over 100 competitions have taken place around the world with thousands of teams in competition over the course of the project. Teams in the 48 Hour Film Challenge have consisted of "one person who sets up the camera then runs around to be 'on-camera'" to one with 70 people. And among the 45,000 teams to participate, was a group of UAT students.



## details

# 35

UAT students entered two teams in the 2006 Phoenix-area 48 Hour Film Challenge, sponsored by the Phoenix Film Foundation, and discovered it's amazing what can be accomplished in 48 hours. While most were sleeping, playing video games or watching TV, two groups of UAT students made two short films. The goal was to create a 3-minute short film from start to finish. The two UAT teams - UAT Pirates and Team Monkey - made the swashbuckling comedy *Pirate Booty* and the dramatic *Face Value*.

Both films were presented at the 48 Hour Film Challenge screening. Though neither movie won Challenge awards, *Pirate Booty* was selected by judges for a special honor, to be shown at next year's Phoenix Film Festival.

*Pirate Booty* centered on a crew of treasure-hungry pirates, seeking land and riches. Director Erin Frisbee and Director of Photography Todd Anderson originally anticipated being placed in the horror or drama categories, even lining up a location permit and a script. Drawing the comedy category took them by surprise. "When we got comedy it was like, 'What are we going to do now? We're going to have to start all over - start from scratch,'" said Frisbee.

Back at the drawing board, the team hammered out a new story in an intense two-hour brainstorming session. The improvised ideas made their way into the script. "It was a collective process, really," said Frisbee. "Everybody wrote their own lines pretty much. There are a couple of lines in there that are scripted, but for the most part it was improvised and then written down. We weren't ready for comedy at all. But I think it turned out better because of that."

*Face Value* was a layered drama, with family tension spilling into an unexpected climax. Producer Jared Kuvent was tasked with getting the production to filming, organizing schedules, assigning roles to crew and finding equipment. The 10-member team collaborated on the script during a frenzied 12-hour pre-production process. Kuvent said, "A lot of people underestimate how important pre-production is. You can create a piece of good work with a lot of organized people in a short amount of time."

## overview

A UAT Student Film



Both teams faced challenges during the competition. UAT Pirates battled the elements while filming in Chandler. The desert heat and wind had the crew on their toes, nearly destroying their cardboard boats. "We buried some posts and nailed them to the posts, and had our actors hold them up during the winds," Frisbee said. "We shot for two hours, in the 120-degree weather, so we were all kind of on the verge of heat exhaustion and downing water as fast as we could."

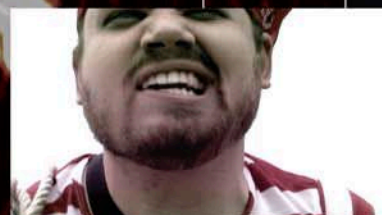
Team Monkey split time filming between UAT and Scottsdale. This made the shoots challenging on a tight deadline, especially when they forgot one of their central props. "Everybody was as careful as they could be, and when they made mistakes we were able to work on other things while we were waiting for that mistake to be fixed or waiting for the prop to get there," Kuvent said. "We had a few slip-ups, but nothing huge."

Sleep was a rare commodity during the two days. The UAT Pirates organized shifts, trying to avoid members crashing during production. While some members slept, others did pre-production work. Frisbee said, "And the next day we jumped right into filming. And I didn't get to sleep until Saturday night. But we slept in shifts, so everybody wound up getting sleep during the weekend."

Team Monkey held out on rest until filming wrapped. Around the halfway mark, several people were hit by the sleepy train. "People started crashing in the editing studio, people started falling asleep in some of the classrooms we had set up," Kuvent said. "Everybody caught at least six hours in the whole ordeal. We got a little bit of sleep, but I think the adrenaline kept us going . . . and Monster Energy drinks."



# challenges



# FINISH

Creating a film in a short timeframe taught both groups lessons on moviemaking. For Frisbee, being flexible and organized helped the production. "I really learned how to just be on the ball and really know where we needed to go, know what we needed to get, and speak up and make sure everybody is doing what they're supposed to."

Kuvent learned that teamwork and communication were essential to stay on course. With a tight deadline, separating personal egos from the project was important. "At any given point, we needed to criticize each other or give feedback and be completely honest if we didn't like something. In 48 hours, you don't have time to sugarcoat everything because the product would suffer in the end."

Lack of sleep aside, the films showed that a lot can be done in two days. "It was a fantastic learning experience that taught everyone a lot about the realities of filmmaking and brought together the DV community," said Kuvent. "People are already excited to enter in the competition next year with bigger and better pieces than ever."



- Pirate Booty
- Erin Frisbie, Director
- Todd Anderson, Director of Photography
- Tracey Shrier
- John Thomas
- Keegan Ead
- Tim Allen
- Scott James
- Jon Ray
- Steve Word
- Chris Anderson

## *participants*

- Face Value
- Jared Kuvent, producer

Post-production work was just as important as the front-end and shooting. Like a puzzle, the important film elements - editing, visual effects and sound - came together. "Post is kind of cool because you see everything that you did beforehand come together and you see the finished product literally come right together," said Kuvent.

Reaction to the screenings was clearly positive, with both teams pleased with the feedback. "Everybody's been dying to see it and we've been sharing it with everybody," said Frisbee. "Someone used the term, 'It's a runaway hit' today."

Kuvent took the positive comments and constructive criticism in stride. "I think it went over pretty well. I'm really glad that the story came across because that was obviously one of the most important things," he said. "There were a couple of sequences that I know we would have done differently."

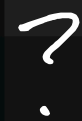
## *successes*

[www.uat.edu/piratebooty](http://www.uat.edu/piratebooty)  
[www.uat.edu/facevalue](http://www.uat.edu/facevalue)





# WHERE ARE THEY NOW?



## CITAGA

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Jeff Addonizio	MTV/Viacom Game Design Department Associate Producer
Cliff Lasana	Seven Studios Level Designer
Andrea Cosgrove	Electric Sheep Company Texture Artist MTV Virtual Laguna Beach Game
Steve Merka	Electric Sheep Company Project Manager

## COR

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Chris Pope	Redstorm Entertainment Production Artist
Nick Herring	Atlantic Cyberspace (ACI) Lead Programmer
Matt Tonks	Electronic Arts Software Engineer on Medal of Honor

## ICARUS

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Daniel Scarberry	University of Advancing Technology Network Security Administrator  <i>* Daniel is also a masters student at UAT for Information Security and is studying for his GMAT to obtain his CISSP and MBA.</i>
Jeremy Leung	Cavecreek Web Hosting Junior Systems Administrator

## PIRATE BOOTY

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Tracey Shrier	Show-N-Tell, Inc. Office Manager/Producer
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“ I get to call myself a professional hacker; the girls really dig that one. I get to play with firewalls, invent security projects and solutions, travel to security conferences such as Blackhat, ShmooCon, Defcon, Scale5x, Lauer One and Techno Security. I’m the Linux guy in IT and an open source community supporter.” **Daniel Scarberry**

“ My main job is primarily to help monitor and administer hundreds of servers running all flavors of Linux, Windows, and Unix platforms.” **Jeremy Leung**

“ I am the office manager for Show-N-Tell, a video production company. We do all kinds of work here, from filming commercials in the studio to going out in the field and recording a live performance, to editing the video...we do it all.” **Tracey Shrier**





## info

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