

2017 Sautter Award Submission: Auto Tracking Camera Podcast System

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Project Description

In Winter Quarter 2015, Educational Technology Services asked faculty in our quarterly Faculty Survey what technology they would like to see added to general assignment classrooms. 35% requested a camera system that could capture content written on a chalkboard. This reinforced frequent complaints from faculty and students that our audio and screencast style of podcasting was not very helpful when instructors used chalkboards.

In Spring Quarter 2016, a group comprised of members from the Podcast, Classroom AV, AV Design and Installation, and Ed Tech Integration teams, looked into the best way to fulfill this desire.

Several of the auto tracking cameras were tested, including some not even on the market. Treb Padula identified the 1 Beyond Auto Tracker camera as the best solution on the market for UC San Diego's needs.

Classroom technology modifications were required to use this camera. The Classroom AV and AV Design and Installation teams worked out a way to control the new podcast recording box along with the auto tracking camera. This solution automates the process of turning on the auto tracking camera and recording the class whenever a recording is scheduled on the podcast calendar. The Podcast team redesigned the podcast website to allow viewing of both the content window and the camera window. The Ed Tech Integration team, working with instructors in the classrooms, calibrated the auto tracking camera and made changes based on faculty comments after using the equipment.

The plan evolved to add both the 1 Beyond Camera and the Extron SMP 351 to the pilot classrooms. These devices could be controlled by the classroom Crestron systems already installed in the lectern, including the confidence monitor and controls. Podcasts would be viewed by students and instructors at the [campus podcast website](#).

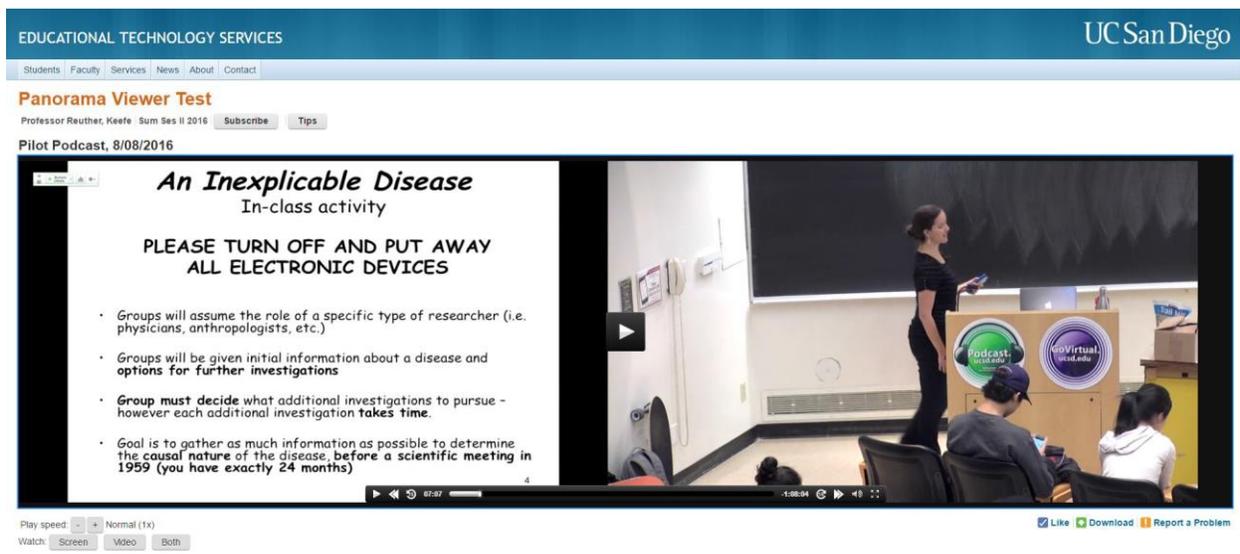
In summary, the group:

- Found an auto tracking camera that could consistently find and follow an instructor during the lecture, without requiring the instructor to wear or do anything special during class.
- Automated the system so a camera operator was not required to capture footage.
- Changed the podcast recording system to handle multiple signal inputs at the same time.
- Integrated the podcasting and camera system into the current classroom control system.
- Upgraded the classroom control system to give instructors a confidence monitor and the ability to override the auto tracking camera when preset fixed camera positions are preferred.

The First Pilot

The first pilot of the technology took place during Summer Session 2016. Treb worked with Extron and 1 Beyond during the pilot as bugs or issues arose. This was the first time the whole system came together.

Screenshot from Summer Session 2016 pilot (web interface developed by Matthew Fedder of the Podcast team):



The control panel was designed by Kris Formica of Classroom AV. It gives instructors a single screen with a confidence monitor and basic controls for the auto tracking system.



Expanding the Pilot

The Summer Session 2016 was deemed enough of a success that the group was confident to begin a second pilot with a larger pool of instructors. The group identified potential participants using the results from the Spring 2016 Faculty Survey. Treb found a room that two of the potential instructors would be using. After installing and testing the equipment in this new room, he sent out an email to all instructors teaching in the room in Fall Quarter 2016 letting them know about the new technology available to them. Four instructors were interested in using the autotracking camera in their class.

For Winter Quarter 2017, the pilot was expanded to 2 rooms.

Measurement of Success

At the end of Winter Quarter 2017, students in classes using the auto tracking camera were surveyed and we received 101 student responses.

Did you watch any of the lecture videos that feature video of the instructor?

- Yes – 94%
- No – 6%

Were you pleased with the quality of the video? (For example, could you read chalkboard writing? Was the image of the instructor clear?)

- Yes – 92%
- No – 8%

Did the Camera follow the instructor and capture the relative video (like chalkboard writing)

- Yes – 85%

- No – 15%

Do you feel you learned better because of the lecture videos?

- The lecture videos didn't add anything for me - 6%
- The lecture videos helped me learn - 62%
- I don't know if I learned better, but I liked having the lecture video - 32%

Student Comments

- *The videos were one of my main study resources. When I felt that lecture was going too quickly for me to take notes, I would look back at the podcasts to review what I had missed. The projection portion of the podcast was the most beneficial to me since there is not much that gets written on the board. I would see the appeal of the teacher tracking option however for classes such as math that utilize the chalkboard more.*
- *The experience with the video is great! Having the video on the side helps me stay focused and follow/catch-up on any of the chalkboard writings.*
- *I really like that the camera follows the professor and that I can see both the PowerPoint and anything she may write on the board.*
- *I liked how you could switch from the camera or to the professor speaking. I also liked how it followed her every step, sometimes she shows things it's necessary to follow along.*
- *It helped me recap what I learned. Very crucial when professors go so fast.*
- *I liked that you could see the chalkboard writing. It was really helpful, and I think it gets the job done.*
- *The lecture videos made review more enjoyable because they made it feel more like being in class.*
- *For my math class we didn't have the video with the podcast, so when I tried to catch up to a class I missed, the material was unfamiliar and hard to follow along from purely audio. With the video the material became more clear and easier to understand due to being able to see the board and follow along to what Professor Dutton was explaining*
- *It's great for me to be able to go back and watch lectures at my own pace. I was able to clearly read lectures and listen to my professor. Only sometimes I can't see her, and I cannot see where she is indicating on a slide during an explanation.*
- *The way the camera followed the professor is extremely useful for times when they write on the chalkboard. It allows the relevant information to be magnified enough to see.*
- *The videos are incredibly helpful, especially because they show both the instructor and the slides. It makes the class sooo much easier. It would be awesome if all my classes had this feature.*

Faculty Comments

- *Solis 107 has the camera, and I'm part of the pilot. I think the video is great!*
- *I announced the change [from a room without the auto tracking camera to one with it] to my students in CSE 20 yesterday. They were very happy and cheered loudly.*

This feedback demonstrates the following about this project:

- An effective and innovative solution to meet our customer (faculty and student) needs.
- The potential to effect broad positive change across all UC campuses.
- Collaboration between several teams.
- Usability and accessibility improvement for students.
- Ease of implementation for other UC campuses

Moving Beyond the Pilot

As more students view podcasts with the auto tracking camera output, they have become more vocal about asking instructors to use this system.

Due to overwhelmingly positive response to the auto tracking camera system, the pilot was declared a success. The auto tracking camera will now be rolled out throughout UC San Diego's general assignment classrooms. By the end of Summer Session 2017, 9 of 25 general assignment lecture halls will have the new system installed.

Demo Video

This demo video shows the auto tracking camera in action. The footage comes from a 300 seat lecture hall. With the camera, every student gets the experience of sitting in the front row with a clear view of the chalkboard.

[Auto Tracking Camera Pilot Demo](#)

