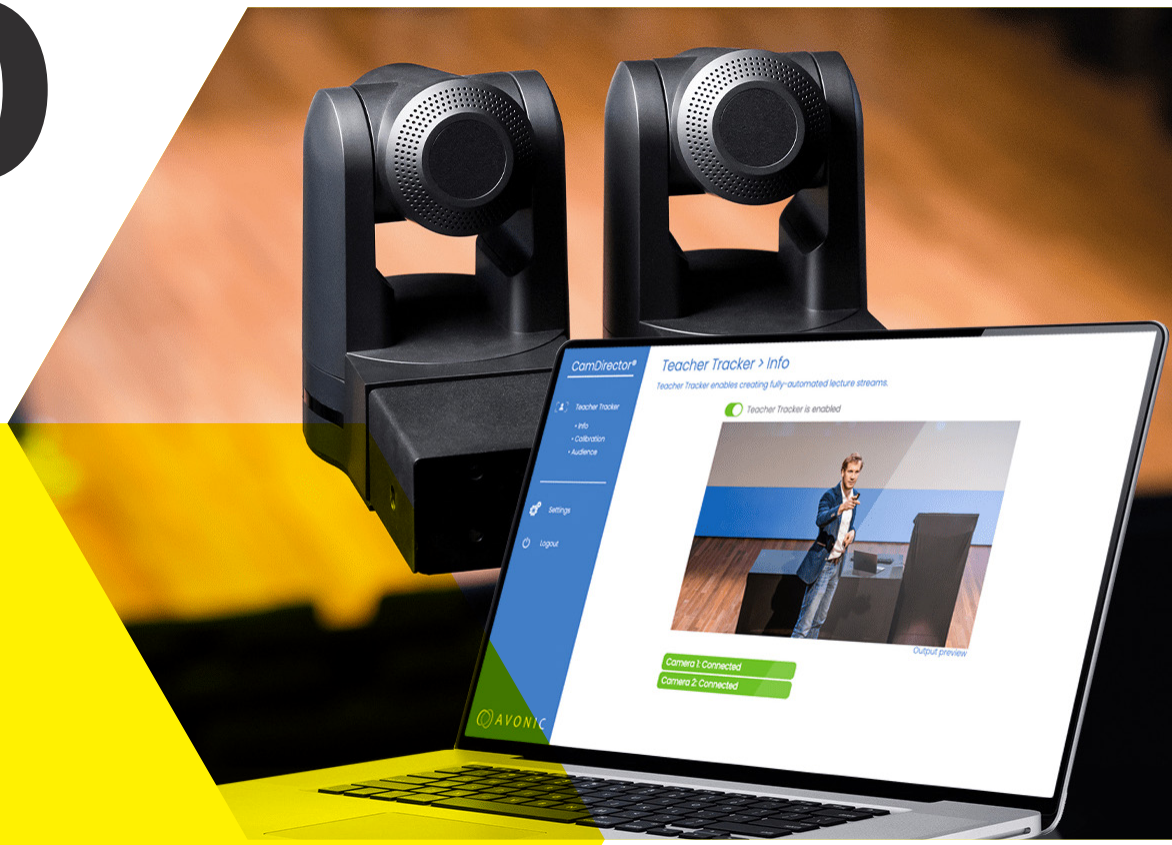
Lecture Capture 2.0



Maximising the potential for student engagement and learning outcomes through more effective lecture capture and live streaming

A White Paper on Lecture Capture Developments

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Lecture Capture has yet to deliver its true potential for student engagement and learning.

The use of rich media, especially video, now reaches into every part of our personal and professional lives, and most campus-based videos don't provide the quality of output that we have now become expectant of. In classrooms, lecture halls and conferences, we still get whole views of spaces with a lecturer and content appearing in the distance.

In this white paper, we will discover how using CamDirector® TeacherTracker's AI software with dual Avonic Cameras can transform your Lecture Capture to:

Increase Student Engagement

Support Diverse Student Groups

Widen Participation

Enable More Effective Teaching

Develop Effective Study Strategies

Define New Standards

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Background

Lecture Capture has now been around in higher education for over 15 years and, despite having initially faced much well-intentioned resistance, its widespread use today is greatly valued by students who benefit from the recordings in many ways.

Those concerns include universities being mindful that copyright infringements could accidentally be incorporated into material, and lecturers have concerns that their content might be used after their employment has ended, used elsewhere without their permission or reward, or even used to replace them! But one of the biggest ongoing objections is that the ability to view a recording later reduces the real-time attendance in the lecture hall. Whilst there may be an element of truth in this, it can also be argued that lectures themselves are a poor method for learning, and that teaching with an absence of student engagement is a self-fulfilling prophecy, requiring professional intervention to create teaching that boosts student attendance. In truth, there are numerous factors that influence physical attendance, and not just the availability of a video recording.

Believing that students wouldn't learn from a recording has long been a pedagogic objection. Before our digital world and today's lecture capture being instantly available online, back in the 1970s and 80s the Open University broadcast lectures during the night on BBC TV, which students recorded onto VHS tapes to play back and learn from, leading to many thousands of successful graduations.

The reality is that if there's a desire or necessity for self-learning, then lecture capture can be an effective study tool. Covid demonstrated that the effective use of technology enabled students to continue their studies when in-class attendance wasn't possible, although there were negative effects from the reduction of teaching and peer support and community engagement, along with increases in isolation.

For some students, especially those who require reasonable adjustments to be on-campus, or suffer with anxiety, are neurodivergent, or must work or be care-givers alongside their studies, remote learning has enormous upsides in their often-complex lives. In many cases, it is only lecture capture and other technology-delivered materials that enables those students to continue and successfully complete their education.

And Lecture Capture shouldn't be an either or, but an integral part of a toolkit of study skills that students should receive guidance in. Knowing that there will be a recording available within a short period of time, maybe students shouldn't be distracted making notes in the lecture hall, but should use the recording to revise the content, pausing playback when they need to make notes or research something that isn't initially fully understood. For students with visual or hearing impairments, and for those where the teaching language being used isn't their mother tongue, lecture capture is invaluable for adding to understanding, allowing students to take control of their own learning.

Historical Lecture Capture Deployments

Lecture theatres were never designed for capturing video and audio, and many spaces continue to be a challenge. Capturing hand-written walls of writing in STEM-based classes continues to occupy the minds of AV experts, but continual advances in projection and display sizes, together with the improved quality and brightness of those images, have massively improved the visibility and therefore the intelligibility of content being presented.

Lecture capture is mostly achieved using a single PTZ camera that can **P**an, **T**ilt and **Z**oom in or out hence their name. Lecture capture is used in smaller standard classrooms too, and in lecture halls typically the whole of the front area is captured in one camera view. Having a small selection of views, by getting the camera to pan and zoom, can be pre-set into the camera control, or can be changed in real-time. To change the camera views, either the lecturer must now concentrate on the control of the camera, or else have the services of a learning technologist or a teaching assistant in the room.

When the image captured is the whole of the front of the room, it's now difficult, if not impossible, to detect the body language and gestures of the lecturer, which could increase comprehension and would increase engagement.

More Intelligent, More Impactful Lecture Capture

CamDirector® TeacherTracker from Avonic, receives the video from two simultaneously connected cameras. One camera captures the entire front of the room, the other provides a close-up of the lecturer.

The cameras positions – one for tracking, one an overview – are configured in a matter of a few minutes and thereafter the cameras are left on. When the lecturer enters the learning space, the CamDirector TeacherTracker automatically starts following the lecturer with the tracking camera. When a second person enters the stage or when the lecturer leaves the stage or walks too fast, the overview camera automatically takes over. The stage will always remain in view by default.

Using movement, CamDirector® TeacherTracker automatically determines which of the camera feeds it will share with your lecture capture platform, such as Panopto, Echo360, Kaltura and more. When a single person is detected, the close-up camera is selected. There is no panning or zooming of the camera, the system intelligently switches from one camera to the other, giving your content the same high value production qualities that are usually associated with off-line video editing.

Take a look at this short 40 second video showing how tracking the teacher is exponentially more engaging than a wide-angle view of the whole room.

https://vimeo.com/912600135

As you can see, now everyone accessing a live stream or a recording, is getting the same experience as if they were sat on the front row, fully enabling body language and gestures to have the impact that being physically on the front row would provide. And, should they be creating complex formulae or explaining using a whiteboard, you can actually see what is being taught.

For a lecturer, they are no longer constrained to remaining in a static position at the podium in order to comply with the restrictions the capture area of a pre-set camera setting allows. Wow, with the freedom to move across the space and engage with students, student engagement will rise too.

Wireless microphones have long been deployed for effective voice reinforcement, it's the antiquated camera technology that has restricted movement or else made any handwritten content almost worthless in lecture capture, and even for those at the back of lecture halls. Remote and hybrid students all having a front row seat when using CamDirector® really will make a difference to engagement, understanding, and therefore their learning outcomes.

Automating improved video capture, single handedly elevates the value of lecture recordings – or live streaming – making them more engaging. Engagement, crucially, is a strong predictor of student attainment.

The Technology

Technology equals change, and change can often equal resistance.

Throughout my time working with universities and at Jisc, I've often been perplexed as to why there is such cultural resistance to technological change within higher education, especially when the overarching goal is always for widening participation, increasing inclusivity, and improving student achievements?

For those supporting the technology, from learning technologists to network engineers, introducing something new means a learning curve for them and the teaching staff they have to support. As an example, moving from OHP film to Visualisers caused enormous upheaval in many teaching rooms. I witnessed many training sessions that only dealt with how the device was turned on, how you could zoom in and out, and how you got the image onto the projector for everyone to see. Very seldom did I see training that included using a visualiser to reinforce information on a PowerPoint Slide, or to reset focus and therefore engagement after a period of discussion, or to use it with student content that could be instantly shared with the whole cohort.

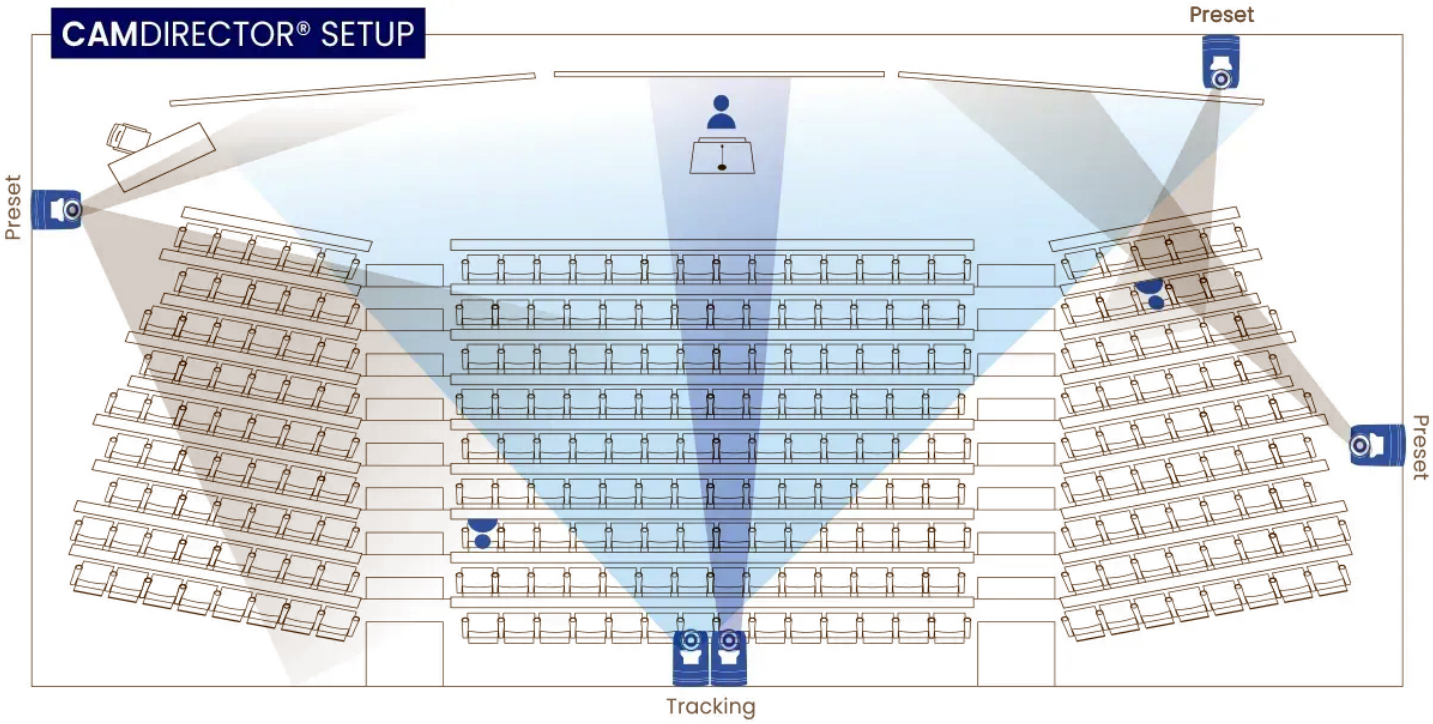
Using Avonic's CamDirector® TeacherTracker removes the resistance to change.

Firstly, Avonic not only claim that once the equipment is installed, the configuration takes less than 15 minutes, but I've actually witnessed the setup taking less time than even that.

Secondly, your current Lecture Capture platform (i.e. Panopto, echo360, etc.) can easily be connected with the video feed from CamDirector TeacherTracker.

Thirdly, for the teacher, there are no camera controls to be worried about as CamDirector TeacherTracker's AI capability fully automates the process. When a teacher is standing still or moving slowly within the defined capture area, the close-up camera will capture them. If they move quickly, or if there are multiple people within the capture area, such as during the introduction at the start of a session, then the whole view camera will take priority. Switching between the two cameras is the job of the CamDirector's AI processing unit, with the selected feed being passed to the existing lecture capture platform (i.e Panopto, echo360, etc.) and into your existing VLE such as Blackboard, Canvas, etc.

This fully automated setup saves lecturers invaluable time and gives them the focus to do what they do best – teaching to fully engaged students.



Need to Capture More within your Space?

In addition to the default setup with two Avonic Cameras, there is the option to add up to six additional Avonic cameras into the CamDirector CD500 AI Processing Unit, configure the areas that you want the cameras to capture, and hey presto, they are available as Preset feeds that can, for example, capture content on a writing board, audience members, a discussion panel or more.

The two CamDirector Teacher Tracking cameras operate automatically, where as the other cameras are selected by the teacher. A simple web interface on their laptop, iPad or iPhone provides a graphic interface to select the desired camera, eliminating the need for a separate controller and video switcher.

This short video provides an overview of how simple it is to add and control additional Avonic cameras to the CamDirector Teacher Tracker solution.

https://vimeo.com/841786361

Ongoing Updates

As an AI driven solution which will be continually developed, over-the-air updates allow support and future features to be added instantly, without taking up valuable campus AV or IT service time.

Live Streaming for Hybrid Teaching

Higher Education engages with its students in ways that businesses do not with their employees. Not every module or lecture of every course, especially those with specialist equipment and hands-on learning, are suitable for delivery to remote or hybrid participants. Indeed, many lecturers would like to have all their students present for every lecture, with no opportunity to 'skip class' and catch up later, nor for remote-based students to join in a hybrid fashion.

Recording lectures is only one mode of teaching, along with flipped classrooms, workshop practicals, and more. But, as I pointed out earlier, the great majority of students value being able to access lecture recordings, with many different priorities for doing so.

Video streaming (content that is broadcast live in a synchronous format – which can also be recorded for access later) is used in several different scenarios. During Covid, when on-campus classes were prohibited, all classes, live streamed or recorded, were delivered to fully remote students. Our forced adoption of video during Covid, for family conversations, business meetings and learning, has led to a greater acceptance of video platforms. In many circumstances, including education, using video has improved or enabled other important areas of our lives to better coexist. Almost every educational conference now includes streaming for remote participation, and CamDirector TeacherTracker unsurprisingly increases remote engagement in these additional scenarios.

Hybrid learning, hybrid conferences, and hybrid working are here to stay, widening participation and providing easier access for students with disabilities and illnesses.

Nor is Hybrid learning a new concept. Since 2007 a consortium of UK universities have collaborated to share live and recorded videos for a wide range of PhD-level Mathematics courses, including lectures delivered to students studying simultaneously on many different member campuses.

https://maths-magic.ac.uk/

Supporting Lecturers to Improve the Quality of their Recordings

We think of a lecturer as someone who stands up in front of a class and gives an organised talk designed to impart knowledge to their students.

If all a lecturer is going to do is stand there, read out information that is already summarised or verbatim on a PowerPoint slide, then perhaps video should not be the recording, but the only method of delivery.

Great teachers don't stand still, they don't read verbatim. If they have visual content, they reinforce it verbally, they patrol the front of class engaging their students as their passion brings the subject to life. In many learning spaces, having just one camera fixed on the podium has (re)enforced these static and less-effective behaviours.

Recording lectures with just a one-dimensional view, without the close-ups, without the body language, without the gestures, is really missing an opportunity to give additional value to lecture capture.

Your VLE will report on how often recorded lectures are accessed, and many surveys report that large percentages of students rely on recordings for review, revision, or because they were unable to attend.

From your choice of clothes to the accompanying visual material you choose, and even breaking up content and resetting focus with a Visualiser, there are many ways that learning enhancement teams can help lecturers create the very best learning with recordings of their lectures.

Having CamDirector TeacherTracker from Avonic automatically generate and transition smoothly between the very best images is one aspect of their teaching that lecturers no longer need to worry about, as it's being taken care of automatically. The use of video which, when excessively relied upon, can give rise to problems of isolation, should only be one element that self-regulated learning is scaffolded around. Class discussions, small group active collaborative learning, group projects and other activities that promote structure, community and social networking, all have their part to play to create a rounded educational experience with opportunities for immediate feedback.

About POLAR

Founded in 1969, POLAR offer a comprehensive range of products, services and support that help organisations increase productivity whilst reducing costs. We offer technology solutions that help people communicate in the education, corporate and commercial sectors. From simple technology for a single person or small group of users, to collaboration platforms with the power to connect dispersed groups and individuals in multiple locations across the world. Within education, POLAR's solutions empower schools to create a range of effective immersive and creative educational environments. Clear communication is the foundation for learning, enabling inclusivity and higher levels of engagement that enable successful learning outcomes.

Based in Burgess Hill, West Sussex, POLAR exclusively represents many audio, visual and workplace technology companies in the UK and Ireland and work directly with the approved specialist integrators who supply and support the education sector.

About the Author

Duncan Peberdy has worked with universities and colleges to identify and establish digital technologies that enhance learning and teaching since 2006.

As the effectiveness of small group active collaborative learning (SCALE-UP) which initiated in the USA started attracting attention in Europe, Duncan, with support from Jisc, initiated the Learning Spaces Roadshow that brought together the many different requirements for success, into a pop-up classroom. Creating learning environments with the right furniture and digital technology so that redesigned curriculums could be effectively delivered, brought together many different stakeholders from across the campus.

Becoming a Jisc event from 2018, Duncan's roadshow was hosted in every corner of the United Kingdom, in Ireland, France and the Netherlands too, resulting in thousands of new learning space deployments based on what academics, professional staff and students had all experienced for themselves.

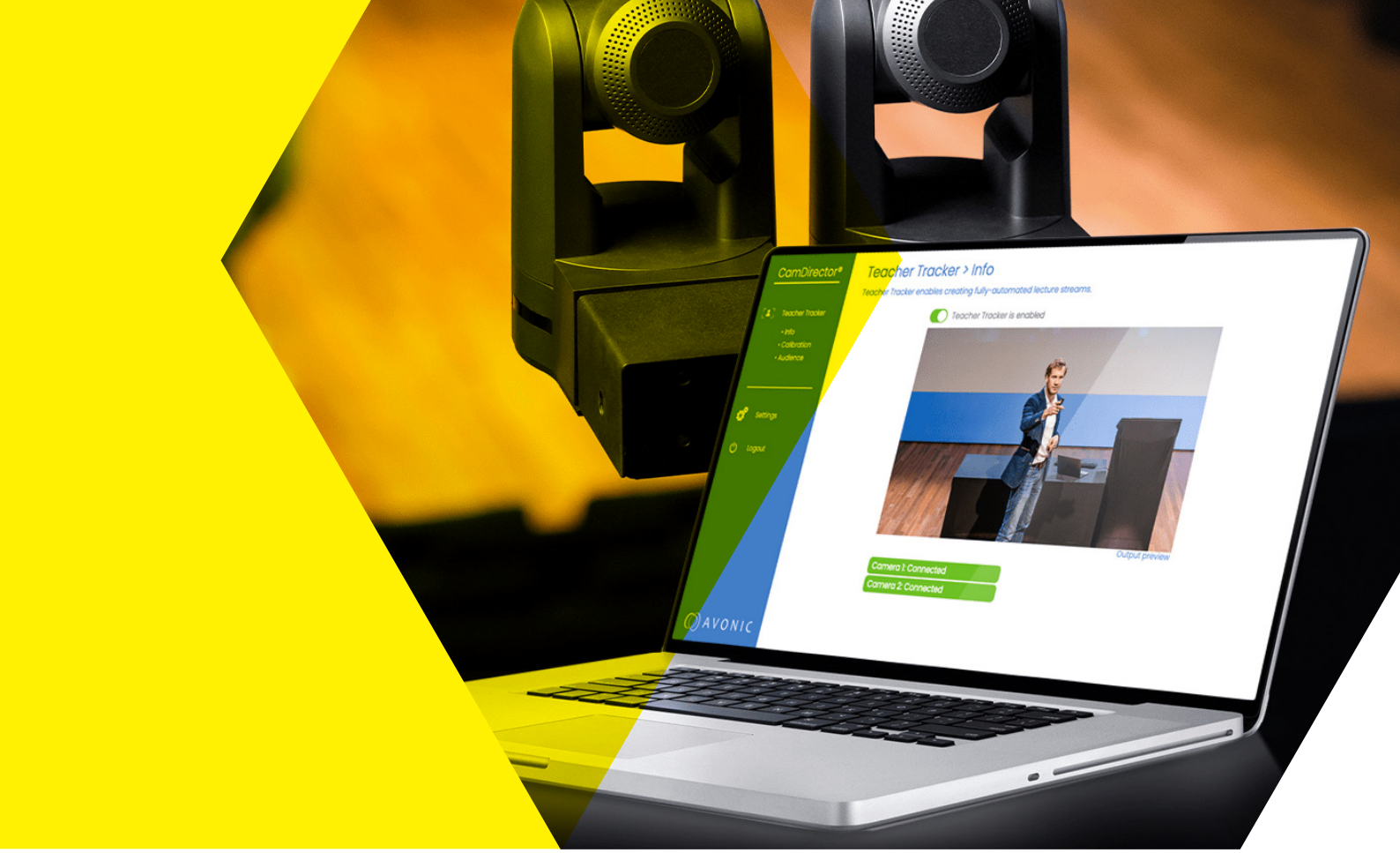
In addition to being a Pearson-published author with two books, ***Brilliant Meetings*** and ***Managing Productive Meetings***, the roadshows spurned two further books:

Active Learning Spaces and Technology: Advances in Higher and Further Education.

Creating the Digital Campus: Active Learning Spaces and Technology.

Duncan has presented at numerous educational Learning and Teaching Conferences, including EUNIS (Paris Sorbonne) and OER (Berlin), moderated roundtables and featured in podcasts.

Duncan's current passion revolves around identifying and using digital technology to provide an equity of participation for real-time hybrid participants, both for students in education and for corporate businesses with distributed offices, teams and remote working.



About Avonic

With over fifteen years of experience in the ProAV field, Avonic is a leading manufacturer of PTZ cameras and AI software. Avonic has been innovating in the industry to bring unique, high-quality audio-visual solutions to many hundreds of different applications.

Based in the picturesque city of Delft, the Netherlands, Avonic's commitment to innovation extends beyond crafting camera products known for their exceptional image quality, reliability, seamless integration, and affordability. Alongside their legacy in delivering top-notch audio-visual solutions, they've ventured into the development of cutting-edge AI-powered software applications, enriching our portfolio with groundbreaking advancements in technology.

They understand that their clients seek more than just a catalog of camera features; they seek a comprehensive support service that aids in selecting the ideal tools for their specific applications. Avonic's dedication to guiding clients through purchase decisions, seamless installations, and ongoing support throughout their endeavors is where their exceptional service truly shines. This commitment to service excellence complements our innovative product development, setting them apart within the industry.

Specialising in providing PTZ cameras and AI-powered software applications across diverse markets including education, healthcare, worship, video conferencing, webcast studios, and webinars, they continually push the boundaries of PTZ application possibilities. Avonic's team of engineers and support staff take pride in delivering responsive, detailed, and adaptable solutions for nearly every PTZ application imaginable.

Whatever narrative you wish to convey, Avonic offers a means to bring it to life. Represented by a global network spanning Europe, the Americas, Africa, Australia, and Asia, Avonic retains the warmth of a local company while embodying the expertise and expansive reach of an international organisation.

Resources in One Place

Short 40 second video of **CamDirector© Teacher Tracker** in use at Wageningen University, The Netherlands
https://vimeo.com/912600135

2 minute 40 second video of **CamDirector© Teacher Tracker** when the lecturer is being introduced and other people walk through the shot.
https://vimeo.com/819085142

Longer 7 minute 55 second video of pre-lecture and the **auto starting of the CamDirector Teacher Tracking solution.**
https://vimeo.com/666760198

1 minute 40 second video of **incorporating additional cameras into an Avonic's CamDirector Teacher Tracking**, so that whiteboards and other content can be captured effortlessly from an intuitive web interface.
https://vimeo.com/841786361

Key Sources

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Moira Sarsfield, John Conway
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