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PureTech Systems, Inc. providing Outdoor Video Surveillance Systems with auto Pan/Tilt/Zoom (PTZ) Tracking, Computer Vision and Machine Learning for Critical Security Applications including Facility Perimeters and Country Borders

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CEOCFO: *Mr. Bowe, would you tell us about the vision for PureTech Systems when you started in 2005 and the focus now?*

Mr. Bowe: Since 2005 our vision has largely remained the same. PureTech Systems set out to build a company that develops and delivers a software system founded on novel and patented computer vision and more recently, ML (Machine Learning) algorithms to help automate the surveillance of wide outdoor areas including perimeters of critical facilities, infrastructure, and country borders. That mission has remained primarily the same since we started.

CEOCFO: *What are some of the variables look for that other companies cannot?*

Mr. Bowe: I think it gets to the root of the technology that we've developed. We have twelve patents in this computer vision space and those patented algorithms are incorporated into our software product. Where our technology shines is in its ability to learn what is normal, or what we call background, in outdoor environments. Then, it's able to detect what is likely an intrusion into a secured area, and notify users through an intuitive user interface application. The ability of a system to reliably detect, classify, and geo-locate moving objects of interest in highly dynamic outdoor environments is a very challenging problem and one we are very good at addressing.

In applications that use computer vision or machine vision to address use cases, such as QA parts inspection or parts placement, the environment is completely constrained and controlled. That is not the case in unconstrained outdoor environments, which is what makes the problems more challenging.

CEOCFO: *Are intruders more clever these days and trying harder to be undetected, or do they even pay attention to what the security system might be as long as they can figure out a way through it?*

Mr. Bowe: Adversaries are crafty and getting more intelligent and they learn as well, so you have to stay ahead of the game in that regard. Having the ability, in some use cases, such as border surveillance, to move sensors around on easy to deploy mobile platforms so that adversaries cannot always know their location is very beneficial. Also, leveraging more than one sensor technology, or combining sensor technologies can make it harder for perpetrators avoid detection.

CEOCFO: *Would you walk us through a couple engagements?*

Mr. Bowe: Historically, we've focused on developing software solutions for the high end of the market in terms of the requirements being very demanding, and the security of the facilities being very important. A firm or government entity comes to us with a critical perimeter they need to secure. We generally get involved early in the process to help design a

solution around our PureActiv software platform. Of course, budget must be considered, and best choices must be made based on available funds. When appropriate, we recommend use of multiple sensor technologies as opposed to being confined to use of “single best technology”.

More recently, we’ve been developing a broader market software as a cloud-based service offering that leverages our computer vision and AI / ML (Machine Learning) technology. We are very excited about this new offering and believe it will have broad market appeal.

CEOCFO: *How do you use AI in this instance and how are you able to harness that to make a difference?*

Mr. Bowe: I think we have a substantial advantage here by combining our superior patented motion and geospatially based video analytics with AI. AI has been around for many years, especially this type of supervised learning neural networks. What has made it more commercially viable, is affordable compute processing for training networks and availability of training data. Although, performing ML evaluation in real-time is still fairly expensive, at least for surveillance applications. We’ve observed others try to rely solely on A.I. to address these detection, classification, and tracking use cases. What we’ve found, is using a combination of our patented motion-based analytics and AI results in greater accuracy and requires dramatically less compute resources. So, while we are certainly using AI we are using it, I think, in quite a novel way.

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CEOCFO: *When someone comes to you, do they know what they want or are they relying upon you to figure out the best products and scenarios?*

Mr. Bowe: They know they need to secure their perimeters and facilities, but they generally do not know what technologies are available. As technologies are constantly evolving and changing rapidly, we must stay abreast of the latest software and hardware technologies, and assess which are available and mature enough to build upon. This way, we are confident we are offering our customers solutions that will last for many years. We have customers that first installed our software 12 or so years ago, and we are able to keep their software upgraded to our latest releases without breaking any existing integrations or legacy features. This is a testament to the hard work of our software engineers to create reliable software architectures and to select software technologies that stand the test of time.

CEOCFO: *Are you looking to get more involved on the commercial side?*

Mr. Bowe: We already offer products that effectively just turn cameras into smart sensor. We have customers that deploy our whole geospatial video and sensor management solution for targeted markets, such as seaports or power generation sites, while we have other customers that just deploy our video analytics, connect it to cameras and then our software sends alarms and some metadata into a third-party command and control or a VMS (Video Management System). We are happy to provide either solution. As I mentioned earlier, we are also working opportunities that take some of our AI technology and offer it as cloud-based service. We have ambitions and initiatives to do just that and we are very excited about it.

CEOCFO: *We came upon PureTech from an upcoming conference. How do you stand out when you are in a room with lots of other companies offering security products?*

Mr. Bowe: Obviously it is a very competitive landscape. Over the course of the last fourteen years, we have gained a reputation for solving some of the tougher problems. Sometimes, I would like to solve some of the easy problems too. Many of our technology partners call us when they are faced with challenging use cases, even though they have their own technology because they know we have superior video analytics. One of our technological advantages lies in our image processing algorithms and how they make use of terrain and video data. The reason it is unique is that it is not easy to do but it’s worth it. We have found an effective way to do it and to deploy it, and the resultant performance is superior to other approaches.

CEOCFO: *What is easier to do with today’s technology and what would you like to do that technology still cannot accommodate?*

Mr. Bowe: The computer vision / AI space, in my view, is still in its infancy. We are witnessing manufacturers of driverless cars developing this technology. Some of the manufacturers are attempting to address automated guidance taking a

multi-sensor approach; using LIDAR, radar, cameras, and other sensors in combinations with AI. Tesla and Elon Musk, are trying to use just cameras and AI computer vision; no other sensors. It's going to be interesting to see which approach prevails. Tesla will have a cost advantage if they can make it work.

Some problems are certainly easier to address today than they were ten years ago, because of the processing horsepower available to run more powerful algorithms. Just being able to deploy a solution that processes video from many cameras economically is something that is a lot easier than it was a few years ago.

Providing highly accurate solutions that meet customer requirements and expectations remains a challenge. This is essentially the same issue faced by driverless car manufacturers. When the technology is being used to automatically guide cars, the required accuracy is 100% and the technology is certainly not there yet. A missed detection or false positive is unacceptable. Although perhaps not quite as critical of an application, critical infrastructure protection requires high accuracy, as well. In general, computer vision technology is very good at detection. The challenge comes in achieving a near-perfect probability of detection while maintaining a near-zero false alarm rate. This is where I think ML technology helps, because it does a much better job of classifying objects even independent of motion. ML does require more data; data being higher-resolution images, but high-resolution cameras are more readily available and affordable now as well.

CEOCFO: *What do you look for in your people?*

Mr. Bowe: Obviously in an organization there are different roles. If we are looking to hire an imaging scientist, a project manager, a software engineer, or an accountant they all require different job skills and education. Of course, our interview process includes rigorous skills and education assessment. In terms of people in general, we certainly screen for honesty, integrity, initiative, curiosity. Additionally, we look for people that want to help other people and, in my experience, that is one of the most important attributes in terms of building a good team. I read an interview once, I don't recall exactly where, with San Antonio Spurs basketball head coach Gregg Popovich in which he was asked what he looks for in players. His response was that he looks for players that have "gotten over themselves". That really resonated with me. We really strive for an egoless environment and people that want to help each other. Our team interview process includes questions aimed at identifying people that are eager to help other people. By purposefully focusing on helpfulness, we've been able to build a hyper productive and near-frictionless work environment with very low employee turnover and very high customer retention.

CEOCFO: *Why choose PureTech Systems?*

Mr. Bowe: We will solve your problem. If we cannot solve your problem, we will tell you. We will not take on the problem unless we are confident, we can solve it. We are very innovative, and many times solving the problems requires us to innovate quickly and we are capable of doing so and we do it. If we commit to doing something, we will make it happen. There is no quit in this team and that is how we have been successful, by having that kind of commitment and knowing what problems we can and cannot solve.