CEO CFO

NeuroSky

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Making Machines Conform to Humans, NeuroSky is Bringing to market their ThinkGear Technology that Senses Analog Electrical Brainwaves and Processes them into Digital Signals for User-Interface of Games, Computers and Investigational Medicine

Technology
Brainwave Neuroscience

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Stanley Yang
CEO

BIO: Mr. Stanley Yang joined NeuroSky, Inc. as its Chief Executive Officer in 2005. Prior to his current position in NeuroSky, Mr. Yang served as Sr. Vice President of Business Development and CFO in 2004 at Sage-N Research, Inc. a super computing systems company developing cutting edge technology for proteomics and life science applications. With a prestigious list of customers that includes Harvard Medical School, Institute of Systems Biology, etc., Sage-N products are gaining market share rapidly. Furthermore, Mr. Yang helped set the corporate vision and developed crucial business partnerships with world-class companies such as Thermo Electron and IBM. Mr. Yang led Thermo Electron's equity financing events and guided the company through its successful product launch.

In 1997, Mr. Yang became President & CEO of Triscend Corporation, a fabless configurable system-on-chip IC company. Triscend was acquired by Xilinx, Inc. in March of 2004. Triscend developed two product families with over 200 customers worldwide. Mr. Yang also developed joint venture relationships with major semiconductor companies such as Hitachi, ARM, Sharp, etc. Mr. Yang led Triscend through an acquisition event by acquiring a privately held company, Optimagic, Inc.

Prior to founding Triscend, Mr. Yang spent 11 years at Xilinx, Inc. where he held a variety of technical and management positions in engineering, business development, manufacturing operations, and ASIC operations. While at Xilinx, Mr. Yang's engineering organization was credited for being the largest revenue generating FPGA family, the XC4000 product line, to production. Mr. Yang also worked extensively in developing joint venture business and strategic corporate partnerships for Xilinx. He was the key manager and corporate champion for developing both working and strategic investment relationships among Xilinx, UMC, and Seiko Epson for building leading edge technology Joint Venture Fabs.

About NeuroSky:
NeuroSky ThinkGear technology senses analog electrical brainwaves and processes them into digital signals to make measurements available to power the user-interface of games, computers and investigational medical applications. We pride ourselves on pioneering mass-market, Brain Computer Interface technology (BCI) that is user-friendly and cost effective. We have worked within a trove of academic research to pioneer electroencephalogram (EEG) expertise for our partners to integrate into their consumer solutions.

Interview conducted by:
Bud Wayne, Editorial Executive
CEOCFO Magazine

CEOCFO: Mr. Yang, would you tell us about NeuroSky and what the vision is for the company?
Mr. Yang: NeuroSky is an electronic consumer bio-sensor company. We built an electronic bio-sensor that can be integrated into wearable technology and gear. They are integrated into objects, such as wristbands, smartphones, and anything that you wear or carry on your body.

CEOCFO: What are they used for?
Mr. Yang: The sensors are able to convert bio-signals and human neuron signals into digital signals. This way we can communicate with the devices that we wear and touch digitally.

CEOCFO: What industry are your products used in?

Mr. Yang: It has been used in several industries. We are most well-known for the entertainment industry where our products have been designed into toys, games, and science objects. Star Wars franchised the ability to move the ball up and down with their mind by developing the Star Wars Forced Trainer back in 2009. We have a big collaboration with Mattel for a product called MindFlex, which was an award winning best selling toy. We work with people such as, Toshiba and most recently NeuroWear, with a pair of brainwave-driven ears that can move up and down based on your emotion. Also on the entertainment side we work with a music producer such as Mynd Play from UK to develop an interactive movie. In other words, your feelings and your emotions can change the outcome of the movie. The outcome will vary depending on your mood, which provides a different experience every single time. These are a few examples that we do in the entertainment field. We also work with the educational sector, where our products are being used in tandem with either the iPad or android pads. Our headset provides biofeedback to the device so when a student studies and understands, the student will absorb the information more efficiently by pay attention. The biofeedback can also display when the student is not concentrating at all. Similarly the function of the headset can be used for some healthcare and wellness treatment. For example last year we released a product called Focus Pocus. It was a program developed by NeuroCog which involved many doctors at universities. The game was written by NeuroCog to help people alleviate the symptoms of ADD and ADHD. The beauty of our product is that we built it into a platform. A good analogy would be like an iPhone; where Apple built the iPhone and many of the applications into the iPhone app store which tends to have a huge ecosystem of applications from soup to nuts. We pretty much do the same. We built our technology into a platform and opened it up and welcomed developers, companies, institutions, or universities to use our platform to convert their existing research onto our platform or to do research on our platform and develop applications.

CEOCFO: So, you work more with OEMS is that correct?

Mr. Yang: Correct. Our primary business is really business-to-business. We have are more of an Intel inside business model, where we sell the sensors or the headsets to our customer. Then our customers build them into applications and sell the final product.

CEOCFO: Would you elaborate on how this technology, Think Gear, works?

Mr. Yang: It may seem magical for people, but this technology has been around for over seventy years. If you have been to the hospital or clinical labs, they would have a system to measure your brainwaves, as well as, any other signals from head to toe. We simply took this medical technology and shrunk it into one single chip so it can be embedded in wearable gear. In other words, we took a medical technology that can measure brainwaves, cardio, and muscle signals and turned it into a little chip. It is very similar to how Intel turned a huge computer into a very powerful processor. That is how we did it and that is why you never see it in the consumer sector. We have a commanding lead in the market for this field. The way it works is that the brain operates us all, because it issues neuron commands. Neurons are like tiny little electrons that travel up and down our body. In the computer system there are wiring and conductive materials. In our body there is a nerve system. Our neuron travels up and down the nerve system. These neurons issue small electrical voltage and impulses to stimulate our muscle and therefore we move. What we are measuring are these neuron activities and then we translate these neuron activities into meaningful digital systems so that our computers, cell phones and gadgets around us can understand what we are doing.

"We make machines conforming to humans."
- Stanley Yang

CEOCFO: Are you able to give a command that way?

Mr. Yang: Yes. However, we cannot read thoughts but we detect emotions, but not all and we are able to detect tensions. We call them algorithms. For example if I ask you to focus or pay attention, then we provide a meter that we call the attention meter and from zero to a hundred. When you focus on something we can gauge how well you are focused with a digital number from zero to one hundred. A hundred is very focused and zero is not focused. The sensor calibrates automatically to the user so you are not being compared to the previous user. There are many universities out there that have spent decades using medical systems to study these motions. We simply provide them a chance to convert their years of research onto platform that can be given into the consumers hands. As time goes we will get more algorithms.

CEOCFO: Would you give us an example in the gaming world that someone can do using your technology?

Mr. Yang: I would like to point you to this project called Throw Trucks. It is a project kick starter that just got funded and it is using our headset to basically provide you with the force-like power in Star Wars. This gives you the ability to throw objects at each other. They developed the game using our technology in that particular first person shooter base.

CEOCFO: It is based on the person's voice pattern-is that correct?

Mr. Yang: Yes but it does auto calibration of our technology.

CEOCFO: How big is the gaming industry and the possibilities for you and do you have more projects in the works?

Mr. Yang: The gaming industry is only one of our five industries that we are engaging in. Our platform has been used by many different platforms or industries. The potential

of the market is quite larger. There are projects at work. We are in the entertainment industry and have several complete, which are developing more products that will hit the market hopefully soon. We are also working the mobile industry. Our sensors have been innovated into accessories and smart phones. We cannot talk about those applications until they are announced by our customers. I can tell you the general trend, people are integrating our sensors into wearable technology and technology you carry on your body such as smart phones or smart watches and bracelets and musical headsets.

CEOCFO: Do you have the funding you need for now and will you need funding moving ahead?
Mr. Yang: We are a venture backed company, so we are not looking for funding now but we did do four rounds of financing.

CEOCFO: Why should the business and investment community pay attention to NeuroSky?
Mr. Yang: Our technology enables humans to no longer conforming to the design of the technology but we are actually making a paradigm shift. We make machines conforming to humans. What I mean by that is we have all these smart phones, gadgets, computers, and cars. We have to conform to their design by using them the way they are designed typing on a small keyboard, or you want to drive a car, or flip on a light switch but if you were to integrate our sensors everywhere when the temperature is too high, we sense that you are too hot and then will blow AC on you. When your phone comes in you are in a good mood and you can answer it and if you are in a bad mood you can reject it. Those are the things I am talking about. We are going to allow our gadgets or technology to conform to how we feel without having us to physically do something that is not natural. We are going to make technology more naturally communicating with us and therefore I call it that we are going to make machines conform to humans. That is our vision.

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