



Real-Time In-Situ Subsurface Imaging Technology Allowing the Oil and Gas Industry to See Subsurface Activity, Improve Productivity and Reduce Risk



Dr. WenZhan Song
Founder
Intelligent Dots, Inc

CEOCFO: *Dr. Song, your website indicates that you are connecting dots for intelligence. What is the idea behind Intelligent Dots?*

Dr. Song: Our vision is to build a company with a core competence in the Internet of Things, through the development of intelligent dots that can compute and think. Our first product is “subsurface camera and video camera” for the oil and gas industry. Today this industry is using a great deal of dumb seismic recorders that logs data in SD card or hard disk. The data are then manually retrieved from the field and uploaded to a central computer for processing and computing subsurface images. The whole process can takes months to complete. We are creating intelligent seismic recorders that can compute and communicate, so that the data processing and computing can be done in the field, delivering sub-surface imaging in real-time. It has a significant impact in reducing costs and improving production and efficiency of oil/gas E&P.

CEOCFO: *What did you develop and how did you develop it?*

Dr. Song: We equip each seismic station with a low-power CPU (similar to smart phone CPU) and a wireless mesh radio at each station, so that they can compute and communicate with each other. Together they form a computer cluster like a super computer, such that the data processing and computing can be done in there. Intelligent Dots converts the existing centralized data processing, inversion and migration computing algorithms to smart decentralized algorithms, so that the subsurface imaging can be calculated in-situ in real-time. That is how we are making the time span of subsurface imaging process much shorter than the current solutions.

CEOCFO: *Has this been tried before where they attempted to have a simpler, faster process, or is this a breakthrough effort?*

Dr. Song: This is a breakthrough effort. We are pioneers in creating and experimenting geophysical sensor networks. We successfully deployed the first air-dropped sensor network in the Mount St. Helens, a volcano in Washington State, in 2009. No one has tried this before. From that experience, we also realize that, if real-time subsurface imaging is ever needed, data collection approach will hit a dead end because of spectrum limitations, in-situ processing and computing is necessary and the only viable way to do that. If we talked about this idea fifteen years ago, the computing and communication technology were not there yet. But today, the smart phone is as powerful as the desktop computer of 15 years ago. Because of the development of Internet of Things and smart phones, the industry is making the CPUs and radios more powerful, yet smaller and less power consumptive. Secondly, the in-situ computing requires a decentralized approach, which is not a trivial problem. When we started the research of decentralized processing and computing five years ago, almost nothing on that had been explored by the community yet because such problems did not exist. Today, in-situ computing has started to receive more attentions because of massive data generation from Internet of Things. We are at the right time to do this and are ahead of the wave.

CEOCFO: *Where are you in the development and commercialization process?*

Dr. Song: This concept have been demonstrated and evaluated in our software and hardware emulators. We have also done field trials in volcanoes, and right now we are in the process to work with some industry partners to do a field trial in one or two months. We are focused on finishing our first generation product for induced seismicity monitoring, and then we will go to market.

CEOCFO: *Is the industry or the people that should know what you are doing aware of Intelligent Dots or are you still under the radar?*

Dr. Song: We already have several partners, so we are not completely under their radar. In the past 4 months we have attended two energy venture start-up forums in Houston and consistently received great recognitions. Intelligent Dots is

recognized as "Most Promising Company" in the Rice Alliance OTC Startup Roundup in May 2015 and "Most Promising Energy and Clean Tech Company" the 13th Annual Energy and Clean Technology Venture Forum in September 2015. We look for visionary technology investors and strategic partners.

CEOFCO: *Why did you choose to start in this area?*

Dr. Song: Good question! We choose to start in this area because I have collaborated extensively with the geophysical community in the past ten years. Since I became an assistant professor in Washington state in 2005, I have been working with geophysicists of academic and industry, such as US Geological Survey and NASA Jet Propulsion Laboratory. I have good connections in this area, understand the problems well and see that real-time subsurface imaging is a very high demanding technology for the Oil and Gas Industry.

CEOFCO: *Are you looking at the international community or mostly in the US at this point?*

Dr. Song: At this point we are focused on the US, but we have received interest from the international community. We do intend to expand internationally in the future.

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CEOFCO: *Why pay attention to Intelligent Dots today?*

Dr. Song: Intelligent Dots is doing one thing right now. We are creating the first subsurface video cameras. The Real-Time In-Situ Subsurface Imaging (RISI) technology will be written in history. It will be a milestone of technology history once we make it happen. It is a groundbreaking technology that allows us to look under the subsurface in real-time. Therefore, a high-demanding application is in the oil and gas industry, related to their exploration and production activities. For example, with Hydro Fracturing, the operators need to know the subsurface situation in real-time, because this implications in improving productivity and efficiency, as well as reducing risks. We have a great market, as we are replacing the old technologies, and offering faster results. We have received a great deal of attention from the energy ventures, and look for investments and partners to quickly expand our efforts.

Interview conducted by: Lynn Fosse, Senior Editor, CEOFCO Magazine

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