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OHSU's latest tech spinout? A dome-shaped data center.

A new startup, Server Dome, has licensed from OHSU the design for its energy-saving dome-shaped Hillsboro data center.

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Oregon Health and Science University is known for spawning health care and biotech startups, but one of its latest spinouts is in a seemingly surprising field: data center design.

A pair of Portland entrepreneurs have licensed technology from OHSU developed by Perry Gliessman, its former director of technology who created a new kind of data center that significantly decreases the amount of energy it consumes.

OHSU built the $22 million Data Dome based on a design developed by one of its technology executives. It's design has been licensed to a new startup called Server Dome that is trying to sell it to others.

Their startup, called Server Dome, hopes to sell more data centers based off the successful design of OHSU's "Data Dome," a geodesic-dome-shaped data center hat has been operating for three years at the university's West Campus in Hillsboro.

Built in 2014 at a cost of $22 million, the Data Dome was OHSU's answer to a question of how it could more efficiently store and analyze the enormous amounts of data coming from its pioneering work in genomics, genetics and imaging.

Typical data centers are highly secure big-box warehouses that contain row after row of computing and storage equipment. They consume massive amounts of power, not only for computing but also to keep the equipment cool.

In developing the OHSU data center, Gliessman looked at how to create something from the ground up that would meet the data needs while eliminating the inefficiencies he saw in current systems.

The key to Gliessman's design is in its shape. His geodesic dome design can handle 4 megawatts of computing with no air conditioning. It uses ambient air for cooling and the dome design pushes warm air up and out. In the winter months the heat from the equipment warms the space. To create even more cool ambient air the facility is designed with small wetlands landscaping surrounding it.

It also has a smaller footprint, at about 180-feet across, so multiple domes can fit on a site. This could come in handy as the need for data centers near high population centers increases with the expected growth of data-intensive technologies such as self-driving cars.

Current high efficient data centers have a Power Usage Effectiveness of 1.2, which means for every 1.2 megawatts it consume, 1 megawatt goes to IT equipment and .2 goes to other systems such as cooling. By comparison, Gliessman's Server Dome design has a Power Usage Effectiveness of 1.06 to 1.17.

"This design is one of the top performers in terms of overall energy efficiency," said Server Dome CEO Frank Oliver. "The challenge is in order to get the efficiency, the (existing) standards handbook is thrown out the window."

Oliver and co-founder Bruce Brady know that despite its efficiency, the Server Dome's unique shape could make it a difficult sell in a market market accustomed to certain norms. Even so, the dom' three years in operation at OHSU's facility should help make its case.

"A lot of times the word disruptive gets thrown around; this is actually truly disruptive," Oliver said. "It requires the industry to rethink how it view energy efficiency and how data centers are designed."

Server Dome employs four people and is currently part of a larger accelerator called Academic Technology Ventures. ATV has a broad network of entrepreneurs and business experts and was created to help its entrepreneurs find viable university technology to turn into companies. The license between Server Dome and OHSU was completed in February.

Brady, Server Dome's director of business development, came upon the Data Dome technology while he was looking through different universities' technology transfer offices. He and Oliver immediately saw its potential, and the university opted to license its patented technology to get the design out into the world.

"The concept we had worked well for OHSU in operation," said Gliessman, who is now an advisor to Server Dome. "We felt it is something the rest of the world could benefit from. We would like to see the tech put out there in terms of other people taking advantage of the same concepts we do."

Server Dome will spend the rest of 2017 building awareness of the design. Once it lands a sale, Server Dome wouldn't build the data centers for customers, but it would serve as a project manager that works alongside a general contractor.

So far the company is self-funded, Oliver said. He noted that the sales cycle may be long since the product is not inexpensive.

What makes Server Dome unique:

No mechanical heating or cooling, so maintenance costs are kept down
Design offers seismic stability
It's a 4-megawatt data center
Easily configurable, and accommodates different types of servers together
Lower Power Usage Effectiveness, the ratio of total power consumed/power consumed by IT equipment

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