



УНИВЕРЗИТЕТ У НОВОМ САДУ
UNIVERSITY OF NOVI SAD

TOP ACHIEVEMENTS 2018

FACULTY OF TECHNICAL SCIENCES

Sharks Skin panels, published in a leading international journal and exhibited at the international exhibition - Design Computing in Prague, Czech Republic

Scientific paper and exhibition

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Shark Skin panels represent a biomimetic structure which is shaped, analyzed and fabricated by contemporary digital tools and technologies. The project idea is to prevent negative wind impacts in open spaces by changing the shape of the panels that cover the wind protection fences. In the state of the art and current studies, it has been shown and proven that the shark denticles prevent water turbulence. In this research study, the idea is used as a biomimetic inspiration, but as opposed to the previous studies, it is applied for wind intensity reduction. For the purposes of wind simulation, CFD (Computational Fluid Dynamics) analyses were used. It has been shown that Shark Skin panels reduce the wind intensity in certain areas to up to four times in reference to the flat panels and other relief construction panels. The parametric approach to shaping the panel is used to further optimize the shape, thus additionally reducing the wind intensity to up to two times for the dominant wind direction. Within the scope of the research, the fabrication of the panels was taken into consideration. The panels were shaped above a hexagonal basis by using two ruled surfaces with mutually perpendicular directrices as the cutting geometry. Thusly shaped panels were made by using an industrial robot which cuts the polystyrene block with a hotwire, thus generating the ruled surfaces. The flexible numerically controlled tool such as the industrial robot ensures that the geometry parameters stay variable, which enables esthetical and sculptural freedom when applying the panels.

Video presentation: <https://vimeo.com/220454296>

Link to the article: www.sciencedirect.com/science/article/abs/pii/S1672652916604237







