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An Implicit Surface Modeling Technique Based on a Modular Neural Network Architecture


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 [Keywords](#)

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Abstract: Independently from artificial intelligence applications, an artificial neural network can be viewed as a powerful tool for function reconstruction. Previous papers used this property to model an implicit surface out of some control points by reconstructing its underlying scalar field. Such an approach requests the neural network to memorize the control points, which has turned problematic for complex surfaces. In our paper, we show that this problem can be efficiently tackled by adapting the architecture of the neural network to the features compounding the surface: by learning first these features independently and then blending them gradually together, our modular architecture readily comprehends the whole surface. As an example, we model the surface of an animated human body. This approach could eventually help model 3-D textures and be used as well for more classic applications of neural networks.

Key Words: Geometric Modeling, Implicit Surfaces, Neural Networks, Modular Architecture, Levenberg-Marquardt, Ray Casting

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