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A comparative analysis of methods for preparing input data for a neural network to assess lightning hazard.

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Designing lightning protection systems by Polish standardization is a standardized, albeit ossified process. Estimating lightning risk, which is the basic stage of this procedure according to the PN-EN 62305 standard, is at risk of error and discretion. This article presents a proposal for automating the above process. Starting with the simulation of the electric field distribution around objects at risk of lightning discharge, neural networks were used to assess the location of places particularly exposed to lightning hazards.

The article contains a short description of the design of lightning protection systems in accordance with PN-EN 62305 and references to the author's previous publications. The automation elements are simulations of the electric field distribution performed in the Ansys Maxwell environment and neural networks indicating locations most at risk of lightning discharge.

An important aspect of the article is the process of preparing data for the neural network, which can be done in two ways. The first is to use the prepared model in Ansys Maxwell and the simulation results to create an input database. The second one is the Julia environment, and the author's scripts are based on Maxwell's field equations to generate the necessary data for the neural network created in the Darknet environment.

The article also includes a comparison of both methods, conclusions drawn from the considerations, and a plan for further research on the doctoral dissertation.

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