

先端科学技術研究科 修士論文要旨

所属研究室 (主指導教員)	数理情報学 (池田 和司 (教授))		
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学生氏名	平井 恒良		
論文題目	Solar Irradiance Forecasting using Total Sky Images for Maximum Power Point Tracking		
要旨			
<p>To maximize the generated power of photovoltaic cells, maximum power point tracking is implemented. The tracking has a delay and produces a mismatch error. To reduce this loss, solar irradiance should be predicted in order of seconds. In this study, we propose a prediction system using total sky images. Our system consists of the estimation of solar irradiance based on estimated cloud thickness and the prediction of luminance of clouds based on a displacement model. The system is evaluated by our own data that is measured for a week every one second. The proposed prediction system of luminance of clouds outperformed the persistence model and also CNN (Convolutional Neural Network) that learned estimated cloud thickness outperformed CNN that learned grayscale image in terms of RMSE(Root Square Mean Error). This result suggests estimated cloud thickness has effectiveness as a feature of solar irradiance and increases the performance of other methods for solar irradiance forecasting such as architectures of neural networks and other machine learning methods by inputting the cloud thickness estimated by our method as a feature.</p>			