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)	光メディアインタフェース (向川　康博　(教授))		
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学生氏名	HERNANDEZ RODRIGUEZ DIEGO		
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要旨

Event cameras are emerging imaging sensors that offer distinct advantages over traditional frame-based cameras, including high temporal resolution,
low latency, and high dynamic range. However, their high cost and limited accessibility hinder widespread experimentation and development.
To address these challenges, this thesis presents a novel method for simulating event camera data using Neural Radiance Fields (NeRFs).
By leveraging NeRFs' ability to synthesize photorealistic views of complex 3D scenes from arbitrary viewpoints, the proposed simulator generates realistic and diverse
event data that closely resemble real-world sensor output.
This work integrates NeRFs with event-based sensing principles to model how brightness changes in dynamic scenes trigger asynchronous events.
The simulator allows for flexible viewpoint generation and efficient data production, overcoming the limitations of existing simulators
that struggle with generalizing to new perspectives or achieving high realism. Experimental evaluations demonstrate that the proposed method
achieves comparable or superior performance to current approaches in both accuracy and realism.
The main contributions of this thesis include: (1) the design and implementation of an event camera simulator grounded in NeRF-based scene representations,
and (2) the validation of its effectiveness for generating high-fidelity event data suitable for developing and testing event-based vision algorithms.