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THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

PHD STUDENT SEMINAR

TextBoost: Boosting Scene Text Fidelity in Ultra-low Bitrate Image Compression

By

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Abstract

Ultra-low bitrate image compression faces a critical challenge: preserving small-font scene text while maintaining overall visual quality. Region-of-interest (ROI) bit allocation can prioritize text but often degrades global fidelity, leading to a trade-off between local accuracy and overall image quality. Instead of relying on ROI coding, we incorporate auxiliary textual information extracted by OCR and transmitted with negligible overhead, enabling the decoder to leverage this semantic guidance. Our method, TextBoost, operationalizes this idea through three strategic designs: (i) adaptively filtering OCR outputs and rendering them into a guidance map; (ii) integrating this guidance with decoder features in a calibrated manner via an attention-guided fusion block; and (iii) enforcing guidance-consistent reconstruction in text regions with a regularizing loss that promotes natural blending with the scene. Extensive experiments on TextOCR and ICDAR 2015 demonstrate that TextBoost yields up to 60.6% higher text-recognition F1 at comparable Peak Signal-to-Noise Ratio (PSNR) and bits per pixel (bpp), producing sharper small-font text while preserving global image quality and effectively decoupling text enhancement from global rate-distortion optimization.

Date : 14 May 2026 (Thursday)

Time : 3:00pm

Venue : Room 4475 (near Lifts 25/26)

All are Welcome!