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นางสาวนวลดรรณ ตันหยง

ศูนย์วิทยทรัพยากร จุฬาลงกรณ์มหาวิทยาลัย

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EFFECT OF TONER JUMPING PARAMETERS ON TONER DOT SIZE IN DIGITAL PRINTING

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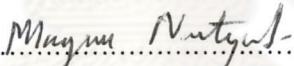
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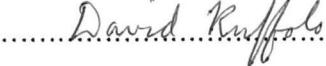

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นวัตกรรม ต้นทาง : ผลของตัวแปรของ 参数โดยดูของหมึกพิ้งต่อการสร้างขนาดจุดหมึกพิ้ง ในระบบการพิมพ์ดิจิทัล. (EFFECT OF TONER JUMPING PARAMETERS ON TONER DOT SIZE IN DIGITAL PRINTING) อ. ที่ปรึกษา : ศ.ดร.สุดา เกียรติกำจรวงศ์, อ.ที่ปรึกษา ร่วม : ศ.ดร. ยาสุชิ โอซูโนะ 120 หน้า. ISBN 974-17-2507-8.

สำหรับการพิมพ์ดิจิทัล หมึกพิมพ์จะถูกส่งผ่านหัวพิมพ์ที่มีความเร็วในการเคลื่อนที่ต่ำ ทำให้หมึกพิมพ์ไม่สามารถสอดคล้องกับความเร็วของหัวพิมพ์ จึงทำให้เกิดการกระโดดของจุดหมึกพิมพ์ ที่เรียกว่า “Toner Jumping” สาเหตุหลักๆ ของการกระโดดนี้คือ การเปลี่ยนแปลงของแรงโน้มถ่วงที่ส่งผลต่อการเคลื่อนที่ของหมึกพิมพ์ บนหัวพิมพ์ ทำให้หมึกพิมพ์กระโดดขึ้นไปบนกระดาษ แต่เมื่อกระดาษเคลื่อนตัวต่อไป หมึกพิมพ์จะกลับสู่ระดับเดิม จึง形成 “跳跃” ของจุดหมึกพิมพ์ ผลกระทบจากการกระโดดนี้ ได้แก่ การลดลงของคุณภาพภาพ ความไม่แน่นหนาของภาพ รอยร่องรอยของหมึกพิมพ์ที่ไม่แน่นหนา รวมถึงการเปลี่ยนแปลงของขนาดจุดหมึกพิมพ์ที่ไม่คงที่ ซึ่งจะส่งผลต่อคุณภาพของเอกสารที่ได้รับ

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NUAWAN TANYONG: EFFECT OF TONER JUMPING PARAMETERS ON TONER DOT SIZE IN DIGITAL PRINTING. THESIS ADVISOR: PROFESSOR SUDA KIATKAMJORNWONG, Ph.D., THESIS CO-ADVISOR: PROFESSOR YASUSHI HOSHINO, Ph.D., 120 pp. ISBN 974-17-2507-8.

Examining the Toner Cloud Beam (TCB) is a new dot formation method for dry toner-based digital printing systems. According to the experimental setup for TCB, a dented electrode, lower control electrode, upper control electrode and pulling electrode are placed as parallel plates, leaving a slight distance between them using insulating sheets. An amount of conductive toner is first applied to the surface of the dented area. When a voltage is applied to each electrode, the electric field is modulated, which makes the charged toner particles move from the surface of the dented electrode, pass through the aperture of the control electrodes and reach the paper beneath the pulling electrode. This technique produces a toner dot on paper. In this research work, the effect of applied voltage and aperture size of control electrodes on toner dot size was investigated. The focus of this study lies on both experiments and simulations of toner trajectory in a TCB system. The TCB experiment was setup. Toner dots were obtained using two different aperture sizes, 1 and 2 millimeter in diameter of the control electrodes. Then the toner dots are generated corresponding to various values of applied voltages on the electrodes. Finally, the electric field analysis has been accomplished and the movement of the charged toner particles has been simulated using ELFIN software. The simulation results agree well with the experimental results. When the voltage applied to the upper control electrode increases, the toner dot size also increases. A toner dot increases in size when the aperture size of the control electrodes increases.

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Nuanwan Tanyong

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