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LIST OF ABBREVIATIONS

AsyDM _{BW}	Asymmetric transformation with original Demons algorithms in backward direction
AsyDM _{FW}	Asymmetric transformation with original Demons algorithms in forward direction
AsyHS _{BW}	Asymmetric transformation with original Horn and schunck algorithms in backward direction
AsyHS _{FW}	Asymmetric transformation with original Horn and schunck algorithms in forward direction
ART	Adaptive radiotherapy
CC	correlation coefficient
CERR	computational environment for radiotherapy research
CTV	clinical target volume
DIR	deformable image registration
DIRART	deformable image registration and adaptive radiotherapy
DSC	dice similarity coefficient
DVF	deformation vector field
GTV	gross tumor volume
HT	Helical tomotherapy
ICE	inverse consistency error
IMRT	intensity modulated radiation therapy
kVCT	kilovoltage computed tomography
MSD	mean square difference
MVCT	megavoltage computed tomography
NMI	normalized mutual information
OAR	organ at risk
SymDM _{BW}	Symmetric transformation with original Demons algorithms in backward direction

- SymDM_{FW} Symmetric c transformation with original Demons algorithms in forward direction
- SymHS_{BW} Symmetric transformation with original Horn and schunck algorithms in backward direction
- SymHS_{FW} Symmetric transformation with original Horn and schunck algorithms in forward direction



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ข้อความแห่งการริเริ่ม

- 1) วิทยานิพนธ์นี้ได้นำเสนอค่าความถูกต้องในการซ้อนทับภาพชนิดเปลี่ยนรูปร่างด้วยวิธีต่างๆ บนภาพเอกซเรย์คอมพิวเตอร์ระดับเมกะโวลต์ โดยเปรียบเทียบกับการซ้อนทับภาพเอกซเรย์คอมพิวเตอร์ระดับกิโลโวลต์ ซึ่งประเมินความถูกต้องแต่ละวิธีด้วยเกณฑ์ 3 แบบ จำนวน 6 ตัวชี้วัด โดยทำการศึกษาในหุ่นจำลองและผู้ป่วยมะเร็งหลังโพรงจมูก
- 2) เพื่อให้สามารถนำมาประยุกต์ใช้กับผู้ป่วยมะเร็งหลังโพรงจมูกในระหว่างฉายรังสีด้วยเครื่องฉายภาพนำแบบเกลียวหมุน วิทยานิพนธ์นี้ได้ศึกษาผลกระทบของความถูกต้องในการซ้อนทับภาพต่อการประเมินปริมาณรังสีสะสมบนภาพเอกซเรย์คอมพิวเตอร์ระดับเมกะโวลต์ นำค่าเบี่ยงเบนของปริมาณรังสีที่ผู้ป่วยได้รับกับปริมาณรังสีตามแผนการรักษาเริ่มต้นมาวิเคราะห์เพื่อเป็นข้อมูลในการปรับเปลี่ยนแผนการรักษาให้สอดคล้องกับกายวิภาคผู้ป่วยที่เปลี่ยนแปลงไป

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STATEMENT OF ORIGINALITY

- 1) The accuracy of deformable image registration (DIR) on megavoltage computed tomography (MVCT) is quantified by comparison with the kilovoltage computed tomography (kVCT). The accuracy levels of the methods were compared using an intensity-based, volume-based, and deformation field analysis with six validation tools. This study investigated on both phantom and nasopharyngeal carcinoma patients.
- 2) In order to apply in patients who were treated with helical tomotherapy unit, this study evaluating the impact of DIR accuracy for estimating the dose accumulation. The delivery dose variation from the initial planned dose were analysed for necessary information to adaptive radiotherapy application.

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