

Kuantisasi dan analisis citra computed radiography pada pemeriksaan sinus paranasal pasien pediatrik menggunakan metode line profile = Quantization and analysis of computed radiography image on paranasal sinuses examination of pediatric patients using line profile method

Sari Yuliani, author

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Abstrak

Penelitian ini bertujuan untuk mengevaluasi metode line profile sebagai cara kuantisasi dan analisa pemeriksaan sinus paranasal dalam citra computed radiography CR . Sampel berupa citra CR dari 45 pasien pediatrik dengan rentang usia 1-5 tahun, 5-10 tahun, dan 10-15 tahun dibagi berdasarkan anatomi yang dijadikan objek kuantisasi yaitu konka nasalis inferior, sinus maksilla, sinus frontal, sinus sphenoid, dan sinus ethmoid, dan dianalisa menggunakan metode line profile. Garis uji line profile dibuat dengan posisi dan ukuran tetap terhadap acuan berupa tulang bony landmark dengan menggunakan perangkat lunak ImageJ. Analisa dilakukan secara kualitatif; yakni membandingkan line profile pasien dengan hasil diagnosis radiolog, dan kuantitatif; yakni membandingkan line profile pasien didiagnosis abnormal dengan baseline dari line profile pasien didiagnosis normal. Hasil penelitian menunjukkan bahwa secara kualitatif metode ini menunjukkan efektivitas untuk anatomi objek konka nasalis inferior, sinus maksilla, dan sinus frontal dengan kecocokan antara kuantisasi dan hasil diagnosis radiolog sebesar 82, 81, dan 100 berturut-turut. Sedangkan secara kuantitatif metode ini efektif untuk objek sinus maksilla dan sinus frontal dengan tingkat kecocokan 89 pada sinus maksilla dan 50 pada sinus frontal.

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This study was performed to quantize computed radiography images on paranasal sinuses examination of pediatric patients. Images of paranasal sinuses examination from 45 pediatric patients at the age ranges of 1 5 years, 5 10 years and 10 15 years were grouped by radiologists rsquo anatomical interests, namely inferior nasal concha, maxillary sinuses, frontal sinuses, sphenoidal sinuses and ethmoid sinuses. Test lines were positioned with respect to each image rsquo s bony landmarks, followed by quantization performed by generating a profile of pixel value along each test lines using ImageJ. The profiles were analyzed both qualitatively and quantitatively. Whereas qualitative analysis compared the line profile of patients diagnosed with and without abnormality by the radiologist, quantitative analysis compared the line profile of images with abnormality with a baseline generated from images without abnormality. Qualitative assessment shown that the method can be applied for anatomical interests of inferior nasal concha, maxillary sinuses, and frontal sinuses with an agreement to radiologist diagnosis of 82, 81 and 100, respectively. On the other hand, quantitative analysis demonstrated a feasibility of this method on anatomical interests of maxillary sinuses and frontal sinuses with 89 and 50 agreement to radiologist diagnosis for maxillary and frontal sinuses, respectively.