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: PACS

CamStudio (Rendersoft, U.S.A.)

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(52%),

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PACS

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(1), PACS

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(picture archiving and communicating system: PACS)

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2006 11 11

2007 2 9

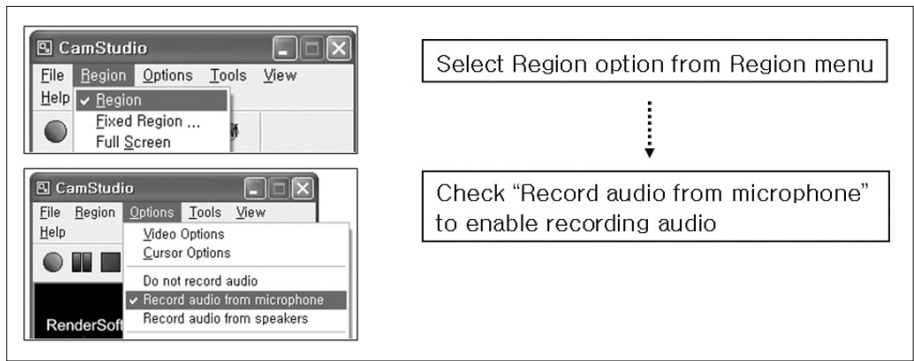
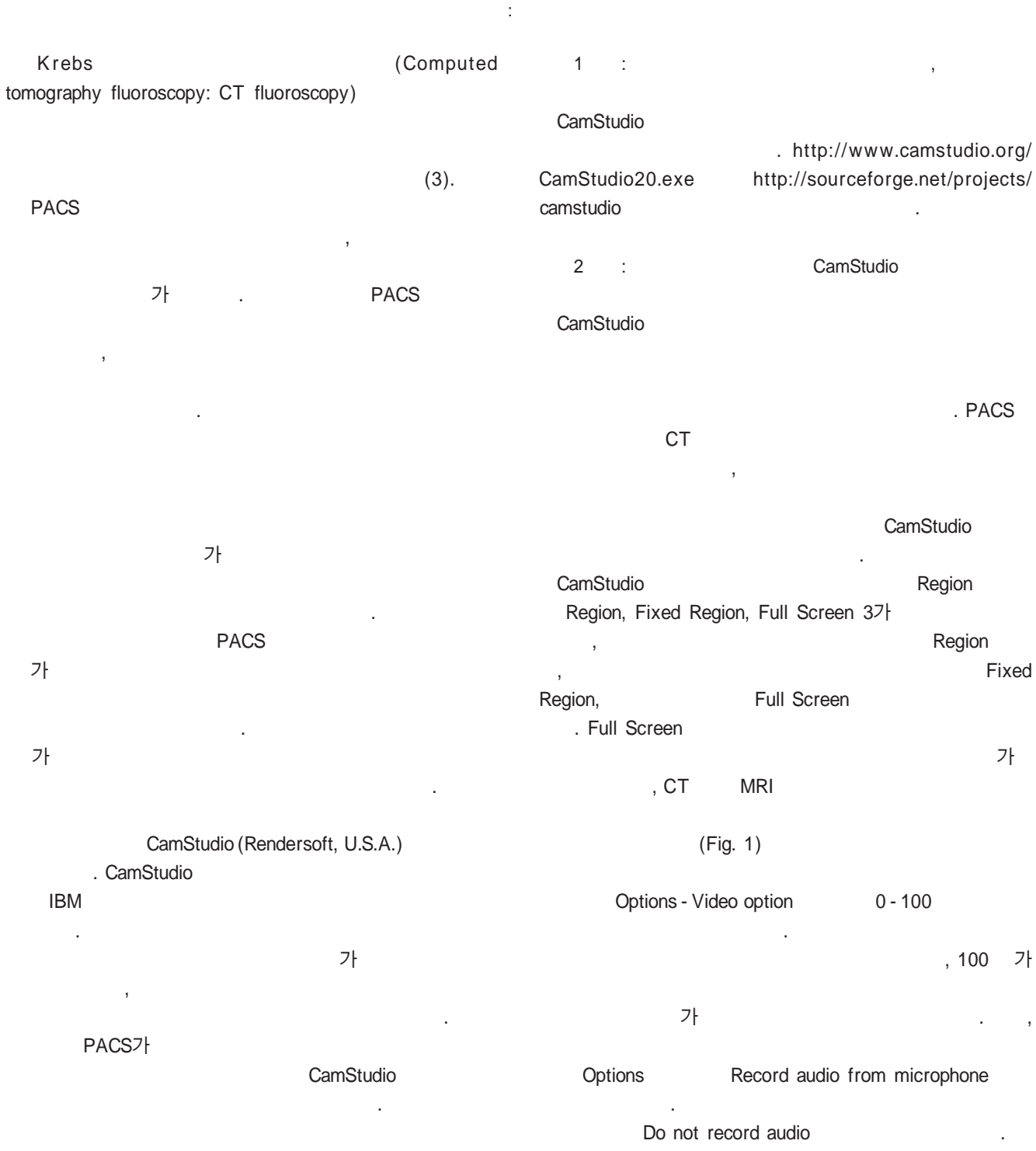


Fig. 1. Flow diagram showing selection of options for adequate screen recording on the CamStudio

3 : PACS
 CamStudio PACS 가 .
 PACS
 CamStudio 4 :
 File - record
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 PACS
 가
 Annotations
 Tools - Screen
 가 ,
 가
 File - Pause Stop
 (Fig. 2). , ,
 가 , ,
 F8, F9, F10 가 , ,
 PACS
 가
 5 :
 CamStudio
 AVI
 가 CamStudio

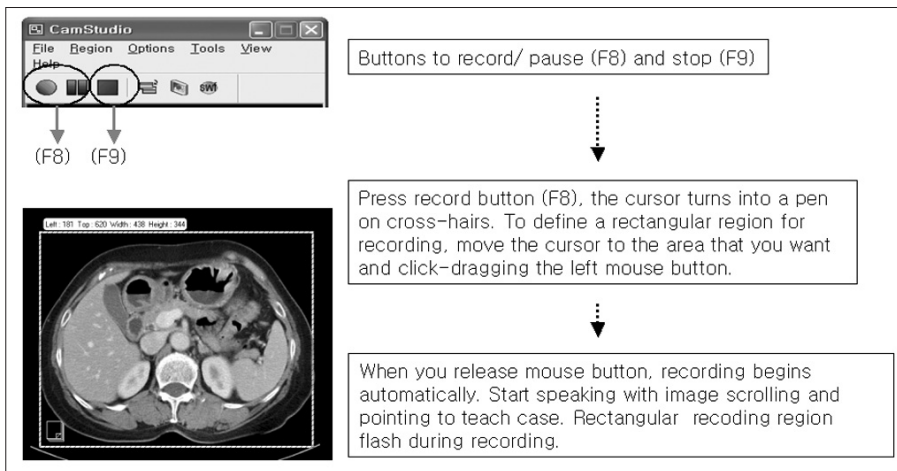


Fig. 2 Flow diagram showing the menu buttons on the CamStudio and the process of recording after pressing record button.

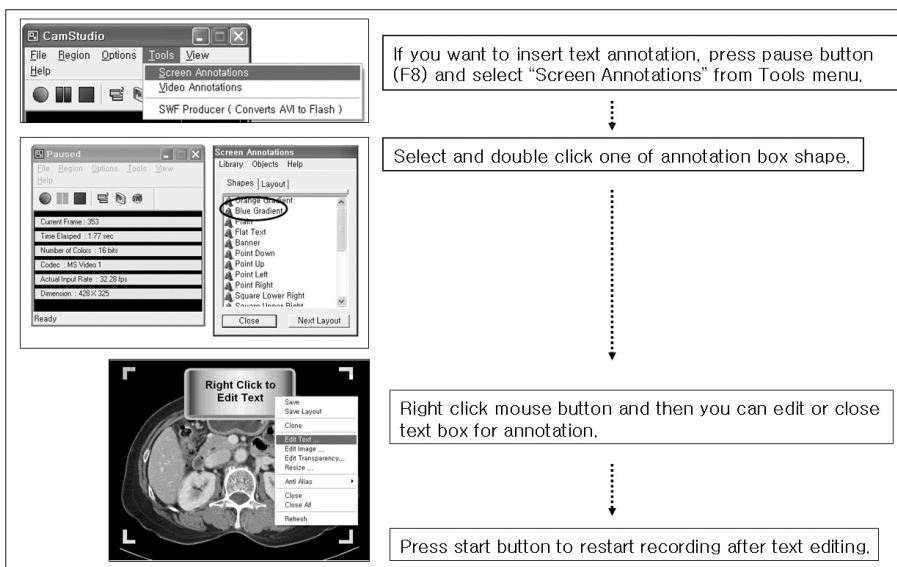


Fig. 3 Flow diagram showing the process of text annotation insertion during screen recording.

가 . AVI , , , 5

CamStudio 가 , , ,

MPEG 가 17 LCD (가 ,

1024 × 1024) 16 cm × 13 cm 2 6가 ,

20 CamStudio 가 .

AVI 13.7 M , CamStudio 7.34 M

가 CT CT PACS 12

CT

1 PACS 1 , 1 Table 1

580 × 460 , 4 , AVI

가 45 5.23 MB, 가 172

CT 17.2 MB

CT

CT PACS 2 ×

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CT CamStudio CT

(Fig. 4).

6 140

Table 1. File Size and Running Time of Created Educational Movies for Abdominal CT Anatomy

File Name*	Screen Size (pixels)	Running Time (sec)	File Size (MB)
Esophagus anatomy	580 × 460	50	6.39
GI tract anatomy	580 × 460	86	8.52
Liver vascular anatomy	580 × 460	120	14.00
Liver segmental anatomy	580 × 460	102	12.20
Biliary system anatomy	580 × 460	140	13.70
Pancreas anatomy	580 × 460	99	10.70
Spleen anatomy	580 × 460	89	9.33
Urinary system anatomy	580 × 460	172	17.20
Male genital system	580 × 460	45	5.23
Female genital system	580 × 460	53	5.10
Abdominal arteries	580 × 460	113	13.90
Abdominal veins	580 × 460	81	11.00

* Frame rate of all movie files were 4 frames/sec.

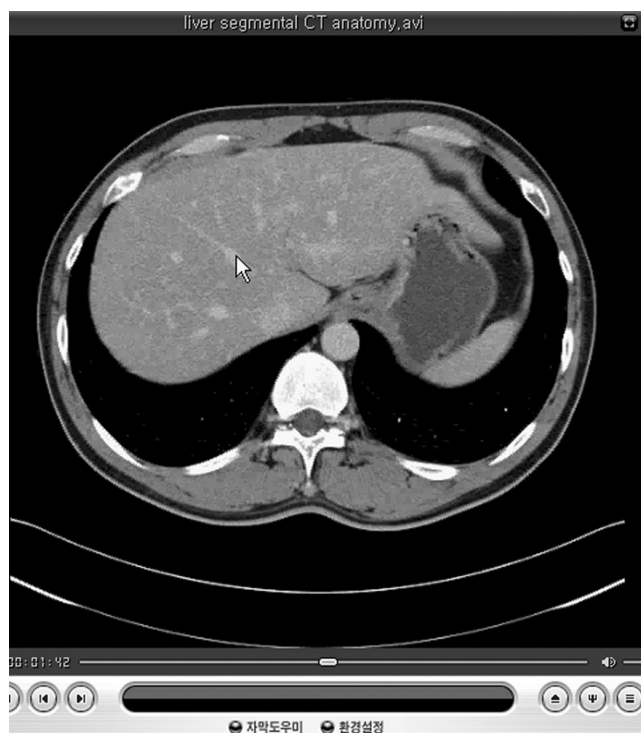


Fig. 4 An example of educational movie clip to help understanding of hepatic segmental anatomy on CT. Middle hepatic vein was indicated by mouse arrow and audio narration of “The hepatic vein is located in the midline area of the liver and is a landmark separating liver to right and left hepatic lobe.” can be heard during playing of this movie clip.

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CamStudio video option

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(http://rad.cmc.or.kr/board/list.php?code=study_open),

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1. Yang GL, Aziz A, Narayanaswami B, Anand A, Lim CC, Nowinski WL. Informatics in radiology (infoRAD): multimedia extension of medical imaging resource center teaching files. *Radiographics* 2005;25:1699-1708
2. Gniadek TJ, Desjardins B. Interactive display of stacks of images in scientific presentations with PowerPoint. *AJR Am J Roentgenol* 2004;183:859-861
3. Krebs TL, Hisley KC, Daly B, Wong-You-Cheong JJ, Perlmutter DM. Creating a digital video-based teaching file for interventional procedures using CT fluoroscopy. *J Digit Imaging* 1998;11 Suppl:124-127
4.
1995;32:677-682
5. HTML
1996;35:143-148
6.
1145-1148 1997;37:
7. JavaScript
1999;40:603-608
8. Web browser
: CT MRI. 2000;42:877-882

A Method for Creating Teaching Movie Clips using Screen Recording Software: Usefulness of Teaching Movies as Self-learning Tools for Medical Students¹

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Purpose: I wanted to describe a method to create teaching movies with using screen recordings, and I wanted to see if self-learning movies are useful for medical students.

Materials and Methods: Teaching movies were created by direct recording of the screen activity and voice narration during the interpretation of educational cases; we used a PACS system and screen recording software for the recording (CamStudio, Rendssoft, U.S.A.). The usefulness of teaching movies for self-learning of abdominal CT anatomy was evaluated by the medical students.

Results: Creating teaching movie clips with using screen recording software was simple and easy. Survey responses were collected from 43 medical students. The contents of teaching movie was adequately understandable (52%) and useful for learning (47%). Only 23% students agreed that these movies helped motivated them to learn. Teaching movies were more useful than still photographs of the teaching image files. The students wanted teaching movies on the cross-sectional CT anatomy of different body regions (82%) and for understanding the radiological interpretation of various diseases (42%).

Conclusion: Creating teaching movie by direct screen recording of a radiologist's interpretation process is easy and simple. The teaching video clips reveal a radiologist's interpretation process or the explanation of teaching cases with his/her own voice narration, and it is an effective self-learning tool for medical students and residents.

Index words : Education

Computers, educational aid

Picture archiving and communication system (PACS)

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