Bare Demo of IEEEtran.cls for IEEE Conferences

Michael Shell
School of Electrical and
Computer Engineering
Georgia Institute of Technology
Atlanta, Georgia 30332–0250
Email: http://www.michaelshell.org/contact.html

Homer Simpson
Twentieth Century Fox
Springfield, USA
Email: homer@thesimpsons.com

James Kirk
and Montgomery Scott
Starfleet Academy
San Francisco, California 96678–2391
Telephone: (800) 555–1212
Fax: (888) 555–1212

Abstract—The abstract goes here.

I. INTRODUCTION

Surgical robotics has evolved quickly since the 1980's and will continue to do so in the future [cite taylor medical 2008]. In some areas, it has even become an essential technology [cite sivaraman robotics 2015]. Although robot assisted minimally invasive surgery (RAMIS) is at worst as effective and at best lowers injury, complication, and death rates significantly compared to conventional surgery, errors still occur [cite razmaria does 2014, punnen how 2013, sung oncologic 2016, raza long-term 2015]. Alemzadeh et al found that around 17.4% of deaths during RAMIS occurred during the operation, and 7% were due to staff mistakes. The majority of injuries were caused by device malfunction, but a not insignificant amount were due to staff errors (see Figure I) [cite alemzadeh adverse 2016].

Injury Reports (Total = 410)	
Example Causes	**Number of Reports (%)**
Device malfunctions	254 (62.0%)
Surgeon/staff mistake	29 (7.1%)
Improper positioning of the patient	17 (4.1%)
Inherent risks of surgery and patient history	16 (3.9%)
Burning of tissues near port incisions	9 (2.2%)
Passing of currents through instruments	6 (1.5%)
Surgeon felt shocking at the surgeon-side console	2 (0.5%)
N/A	77 (18.8%)

TABLE I
MY CAPTION

According to Alemzadeh et al, one key area of RAMIS that may be improved is the "human-machine interfaces and surgical simulators that train surgical teams for handling technical problems". Other researchers suggest a variety of methods to reduce injury numbers, such as dry lab training, simulated emergency handling, including in virtual reality (VR), and even a complete remodeling of operating theaters [cite liberman training 2011, huser simulated 2014, ahmad ambulatory 2016, abelson virtual 2015]. These all suggest that more training is beneficial to reduce error rates.

During an interview with, and observation of, Jane Petersson, First Nurse Assistant and Nurse Specialist in Robotic Surgery at Aalborg University Hospital and MinimalInvasiv UdviklingsCenter (Minimally Invasive Education Centre, MIUC), she stated that some of the most important aspects of RAMIS are routine and training, especially as part of a team. This claim is substantiated by several studies [cite moorthy qualitative 2004, chandra comparison 2010], showing clear improvements for experienced surgeons, but also a significant learning curve.

We, together with Jane Petersson, believe this can be extended to team training in VR as shown by Abelson et al in conventional surgery [cite abelson again] and Huser et al simulating full surgery teams doing emergency fibrillation. VR training has the benefits of being cost-effective compared to regular RAMIS training (10,000 DKK per person), at the cost of reduced accuracy, as well as enabling concurrent multi-user functionality in different locations. This would allow surgeons and nurses to train certain scenarios at their work or at home instead of travelling to certified institutions.

A. Subsection Heading Here

Subsection text here.

1) Subsubsection Heading Here: Subsubsection text here.

II. METHODS

How did we solve the problem

III. RESULTS

What did we find out

IV. CONCLUSION

What does it mean

ACKNOWLEDGMENT

The authors would like to thank...

REFERENCES

[1] H. Kopka and P. W. Daly, *A Guide to LaTeX*, 3rd ed. Harlow, England: Addison-Wesley, 1999.

TABLE II
MY CAPTION

Object	Attributes	Actions
Video	Title Duration Resolution Embedded Audio Channels Brightness Embedded videos	Play/Pause/Zoom Fast Forward/Backward Take screenshot Draw on video (create annotation) Insert embedded video
Annotation Overview	List of annotation frame start	Jump to frame
Annotation	Audio clip Visualization Frame start Duration	Create Delete Toggle show/hide
Audio Channels	Embedded Audio Clip	Toggle channels
Embedded Video	Video clips	Create & place Remove Toggle sound

TABLE III
MY CAPTION

Action	Metaphor-Based
Zoom	Oversized touchscreen zooming
Select annotation to jump to from menu	Swiping pictures on a phone
Place embedded video	Drag and drop
Draw on video	Point and drag
Select draw annotation color	Select color from palette
Record voice annotation	Using voice recorders

TABLE IV
MY CAPTION

Concepts	Relation
User	Owns the videos and audio Creates and own annotations
Video	Contain annotations Each video belong to a folder Has a owner (the user) Statistics
Annotations	Audio clips Drawings Combined Belong to a video Conveys information to the user
Screenshot	Belong to annotation