Closed-Loop Active Compensation for Needle Deflection and Target Shift During Cooperatively Controlled Robotic Needle Insertion

Patrick Donelan, *Graduate Student, Worcester Polytechnic Institute,* Debbie Guenthner, *Graduate Student, Worcester Polytechnic Institute,* Arjan Gupta, *Graduate Student, Worcester Polytechnic Institute,* and Will Yingling, *Graduate Student, Worcester Polytechnic Institute*

Abstract—The abstract by Will goes here.

Index Terms—IEEE, IEEEtran, journal, LATEX, paper, template.

I. INTRODUCTION

THIS demo file will be edited by Will. It is intended to serve as a "starter file" for IEEE journal papers produced under LATEX using IEEEtran.cls version 1.8b and later. I wish you the best of success.

mds
February 7, 2023

A. Subsection Heading Here

Subsection text here.

1) Subsubsection Heading Here: Subsubsection text here.

II. METHODS AND MATERIALS

Sample text inside input file for Part 1 of materials and methods. Sample text inside input file for Part 2 of materials and methods.

III. RESULTS

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

IV. DISCUSSION

The conclusion goes here.

APPENDIX A
PROOF OF THE FIRST ZONKLAR EQUATION

Appendix one text goes here.

APPENDIX B

Appendix two text goes here.

All authors are software engineers in their professional life.

REFERENCES

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

Patrick Donelan Biography text here.

Debbie Guenthner Biography text here.

Arjan Gupta Biography text here.

PLACE
PHOTO
HERE

Will Yingling Biography text here.