

DRONE STATE ESTIMATION USING MULTIPLE INFRARED CAMERAS

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A motion capture system is generally used to estimate drone states in laboratory environments. For this setup, some reflective markers are attached to the drone, and multiple infrared cameras are positioned around the experiment area. The reflective markers' positions in space, along with their relative positions with respect to each other, are captured by the cameras, processed by software on the command center computer and are used to return the 3D position, velocities, and roll, pitch, and yaw of the drone. In this paper, the logic used by the software on the command center computer will be replicated. A system that uses multiple cameras (all with their own biases and noise) will be simulated to estimate the state of the drone.

INTRODUCTION

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THIS IS A SAMPLE OF A GENERAL SECTION HEADING

Numbering of section headings and paragraphs should be avoided. Major section headings are majuscule, bold, flush (aligned) left, and use the same style san-serif font as the body text. Widow and orphan lines should also be avoided; more than one line of a paragraph should appear at the end or beginning of a page, not one line by itself. A heading should not appear at the bottom of a page without at least two lines of text. Equations, figures, and tables must be sequentially numbered with no repeated numbers or gaps. Excessive white space — such as large gaps before, between, and after text and figures — should be minimal and eliminated where possible.

This Is a Sample of a Secondary (Sub-Section) Heading

Secondary, or sub-section, headings are title case (miniscule lettering with the first letter of major words majuscule), flush left, and bold. Secondary headings use the same serif font style as the body text and, like section headings, should not be numbered. Tertiary headings should be avoided, but if necessary, they are run-in, italic, and end in a period, as illustrated with the next six (6) paragraphs.

$$a = b^2 \tag{1}$$

Equations. Equations are centered with the equation number flush to the right. In the text, these equations should be referenced by name as Eq. (1) or Equation (1) (*e.g.*, not eq. 1, (1), or *Equation 1*). To improve readability, scalar variable names such as *a* and *b*² are usually italicized when appearing in text and equations.*

Abbreviations. When abbreviations for units of measure are used, lower case without periods is preferred in most instances; *e.g.* ft, yd, sec, ft/sec, *etc.*, but in. for inch.

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*A section on mathematical notation is provided in the sequel.

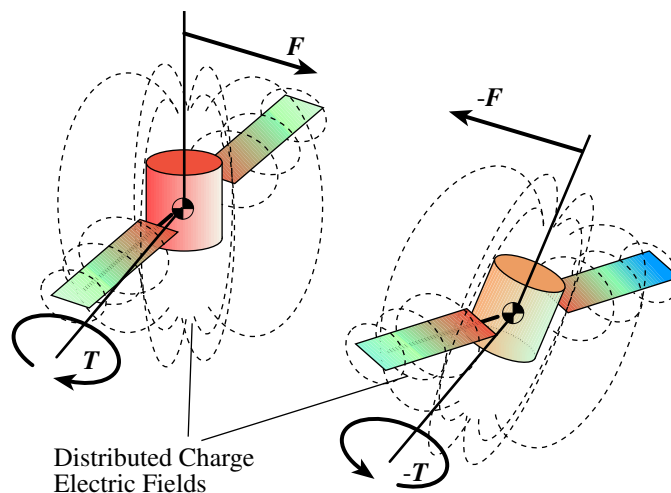


Figure 1. Illustration Caption Goes Here

out or mentioned. Alternatively, it is also permissible to place all figures together at the end of the text as a separate appendix; however, these two conventions should not be mixed. All figures and callouts should remain clearly legible after reduction. All illustrations appear as black and white in the final printing, although colors are retained in the electronic (CD-ROM) version.

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cited.*

Table 1. A Caption Goes Here

Animal	Description	Price (\$)
Gnat	per gram	13.65
	each	0.01
Gnu	stuffed	92.50
Emu	stuffed	33.33
Armadillo	frozen	8.99

Tables. Tables are referred to by name in the text as Table 1, or, Tables 2 and 3 (*e.g.*, not table 1, Tbl. 1, or *Table 1*). The title is centered above the table, as shown in Table 1. The font size inside tables should be no larger than the body text, but may be adjusted down to 9-point if necessary (10-point serif font is considered nominal). Note that table units are in parentheses. Only the minimum number of table lines needed for clarity is desired. Ideally, every table should appear within the text just before it is called out, but, it is also permissible to place all tables together at the end of the text as a separate appendix. If so, these two conventions should not be mixed.

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CONCLUSION

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ACKNOWLEDGMENT

Any acknowledgments by the author may appear here. The acknowledgments section is optional.

NOTATION

- a a real number
- b the square root of a

If extensive use of mathematical symbols requires a table of notation, that table may appear here. Where the first mathematical symbol is introduced, a footnote should direct the attention of the reader to this table.* The notation table should be simple and reasonably consistent with the standards of modern technical journals, as illustrated above. The notation table does not need its own caption like an ordinary table, since the section heading serves this purpose. The notation section is optional.

APPENDIX: TITLE HERE

Each appendix is its own section with its own section heading. The title of each appendix section is preceded by “APPENDIX: ” as illustrated above, or “APPENDIX A: ”, “APPENDIX B: ”, *etc.*, when multiple appendices are necessary. Appendices are optional and normally go after references; however, appendices may go ahead of the references section whenever the word processor forces superscripted endnotes to the very end of the document. The contents of each appendix must be called out at least once in the body of the manuscript.

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