**Optimal mechanical harvester route planning for sugarcane field operations using particle swarm optimization**

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Abstract

This is an instruction for manuscript preparation for publication in KKU-IENC 2021. The abstract should contain a single paragraph describing objective, methodology and a summary of important results. Its length should not exceed 300 words.

**Keywords:** 4-6 keywords, separated by commas, the first letter of each keyword must be capitalized.

1. Introduction

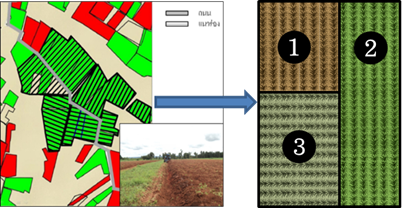
Start the first paragraph and subsequent paragraphs with indentation. Use tab stops or other commands for indents but do not use the space bar. Primary headings should begin at the left margin in boldface.

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**2. Materials and methods**

*2.1 Paper size and margins*

Manuscript should be created using MS Word. Please use A4 paper size (21x 29.7 cm), one-column format. All margins must be 2.54 cm and manuscript should have page numbers and line numbering, and use line spacing 1.5. Figure and tables should be placed as close as possible to where they are mentioned in the text.



**Figure 1** Direction of sugarcane planting groves

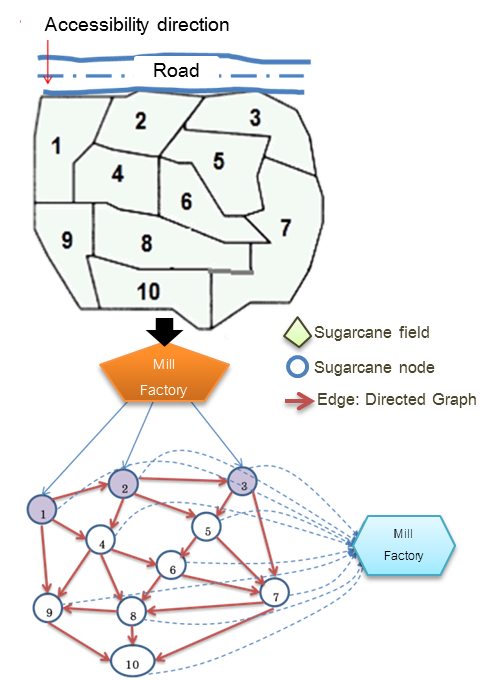
*2.1.1 Structure of article*

The article content will, in general, consist of the following headings: Introduction, Materials and Methodology, Results and Discussion, Conclusion, Acknowledgements, and References.

*2.1.2 Figure and tables*

Line drawings should be of high resolution and high contrast. For color or greyscale photographs (halftones), use a minimum of 300 dpi (.TIFF or .JPG).

Do not upload Excel files or images for tables. Use the table function of Microsoft Word.



**Figure 2** Directed graph of harvester

**3. Results**

The research results should be presented clearly and right to the point with accompanying figures and tables. These figures and tables should be referred to in the content. Explanation must not repeat what is already given in the content.

**Table1** Design of test problems

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Problem** | ***n*** | ***Sp*** |  | ***L*** |
| 1 | 10 | 2 | 200 | 500 |
| 2 | 15 | 2 | 150 | 1000 |
| 3 | 20 | 2 | 150 | 1000 |
| 4 | 30 | 2 | 150 | 1500 |
| 5 | 50 | 2 | 100 | 1500 |

**4. Discussion**

Research discussion is aimed at persuading readers by comparing with other research studies and proposing possible solutions or useful suggestions for solving certain research outcomes, etc. Research results and discussion can be written in one section.

5. Conclusions

The conclusion of points and important research elements should not be too long. Your article should be reviewed by all co-writers before submission

6. Acknowledgements

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7. References

The References part should follow the Vancouver style, and only in English. Please ensure that every reference cited in the text is also present in the reference list. Use an Arabic number in parenthesis after the referred statement. For example, [1] or [2-4, 8, 10] refers to Author 1 or 2, 3, 4, 8, 10 ordering from 1, 2, 3,...to the last number which appear in the reference list.

*7.1 Example of references*

[1] Mostofinejad D, Khozaei K. Effect of GM patterns on ductility and debonding control of

FRP sheets in RC strengthened beams. Construct Build Mater 2015;93:110–120.

[2] Murray PR, Rosenthal KS, Kobayashi GS, Pfaller MA. Medical microbiology. 4th ed. St. Louis: Mosby; 2002.

[3] Meltzer PS, Kallioniemi A, Trent JM. Chromosome alterations in human solid tumors. In: Vogelstein B, Kinzler KW, editors. The genetic basis of human cancer. New York: McGraw-Hill; 2002. p. 93-113.

[4] Harnden P, Joffe JK, Jones WG, editors. Germ cell tumours V. Proceedings of the 5th Germ Cell Tumour Conference; 2001 Sep 13-15; Leeds, UK. New York: Springer; 2002.

[5] Christensen S, Oppacher F. An analysis of Koza's computational effort statistic for genetic programming. In: Foster JA, Lutton E, Miller J, Ryan C, Tettamanzi AG, editors. Genetic programming. EuroGP 2002: Proceedings of the 5th European Conference on Genetic Programming; 2002 Apr 3-5; Kinsdale, Ireland. Berlin: Springer; 2002. p. 182-91.

[6] Borkowski MM. Infant sleep and feeding: a telephone survey of Hispanic Americans [dissertation]. Mount Pleasant (MI): Central Michigan University; 2002.

[7] Cancer-Pain.org [Internet]. New York: Association of Cancer Online Resources, Inc.; c2000-01 [updated 2002 May 16; cited 2002 Jul 9]. Available from: <http://www.cancer-pain.org/>.

[8] Wikipedia. Generation Y [Internet]. 2011 [cited 2011 Jul 5]. Available from: http://en.wikipedia.org/wiki/Generation\_Y

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