

Using Unmanned Vehicles With Instrumented Bug Zappers To Detect & Eliminate Mosquitoes

An Nguyen¹, Kyle Walker¹, Nhan Phung¹, Vinh Truong¹, Erik Van Aller¹ and Aaron T. Becker¹

Abstract—Mosquito-borne diseases kill millions of humans each year. Popular methods to control mosquitoes such as pesticides or adulticides are effective, but they introduce long-term damage to the environment. Traditional electrified screens (bug zappers) use UV light to attract pests, but have a large bycatch of non-pest insects. This paper introduces techniques using bug zapper mounted on unmanned vehicles to autonomously seek out mosquitoes in their breeding grounds such as ponds and swarms and effectively eliminate mosquitoes. Instrumentation on the bug zapper log the GPS location, altitude, weather details, and time of each fried mosquito. Mosquito controllers can use this information to analyze the insects' activities. The device can be mounted on a remote controlled or autonomous unmanned vehicle. If autonomous, the vehicle can use the data collected from the electrified net as feedback to improve the effectiveness of the motion plan.

- [2] Anupa Elizabeth, P.; Saravana Mohan, M.; Philip Samuel, P.; Pandian, S.R.; Tyagi, B.K., Identification and eradication of mosquito breeding sites using wireless networking and electromechanical technologies, in Recent Trends in Information Technology (ICRTIT), 2014 International Conference, Chennai, 2014, pp. 1-6.
- [3] Hur, B.; Eisenstadt, W., Low-power wireless climate monitoring system with RFID security access feature for mosquito and pathogen research, in Mobile and Secure Services (MOBISecSERV), 2015 First Conference, Gainesville, pp.1-5, 20-21 Feb. 2015

I. INTRODUCTION

II. PROCEDURE FOR PAPER SUBMISSION

A. *Selecting a Template (Heading 2)*

B. *Maintaining the Integrity of the Specifications*

III. MATH

A. *Abbreviations and Acronyms*

Define abbreviations and acronyms the first time they are used in the text, even after they have been defined in the abstract. Abbreviations such as IEEE, SI, MKS, CGS, sc, dc, and rms do not have to be defined. Do not use abbreviations in the title or heads unless they are unavoidable.

B. *Units*

C. *Equations*

D. *Some Common Mistakes*

IV. USING THE TEMPLATE

A. *Headings, etc*

B. *Figures and Tables*

V. CONCLUSIONS

APPENDIX

ACKNOWLEDGMENT

REFERENCES

- [1] D. V. Maliti, N. J. Govella, G. F. Killeen, N. Mirzai, P. C. D. Johnson Development and evaluation of mosquito-electrocuting traps as alternatives to the human landing catch technique for sampling host-seeking malaria vectors, Malaria Journal, vol. 14:502, Dec. 2015

¹ An Nguyen, Kyle Walker, Nhan Phung, Vinh Truong, Erik Van Aller, and Aaron T. Becker are with the ECE Department at the University of Houston, TX atbecker@uh.edu