

# **COMPETITIVE ONLINE COVERAGE OF A MOBILE ROBOT**

**2 ONLINE ALGORITHMS COMPETITIVELY ANALYSED**

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# TEASER

# OUTLINE

1 Introduction

2 Spiral STC

3 Scan STC

4 Analysis of the Algorithms

5 Universal Lower Bound

6 Conclusion

# INTRODUCTION

# DEFINITIONS

## Definition Coverage Problem

- let  $D$  be the tool size

# COMPLEXITY

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# RELATED WORK

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# **SPIRAL STC**

# VISUALIZATION

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# 2D SPIRAL STC

# FULL SPIRAL STC

# BOUNDS

# **SCAN STC**

# DIFFERENCES TO SPIRAL STC

# BOUNDS

# VISUALIZATION

# **ANALYSIS OF THE ALGORITHMS**

# THEOREM 1

## Theorem 1

Spiral-STC and Scan-STC cover the work-area grid using a path of total length  $l \leq (n + m)D$

# OPTIMALITY AND COMPETITIVE RATIO

# **UNIVERSAL LOWER BOUND**

## THEOREM 2

# CONCLUSION

# CONCLUSION

- Spiral STC and Scan STC are competitive online algorithms for the coverage problem

THANKS!

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