# INVENTING THE SUIT AND SAVING THE WORLD: ONE HUMAN'S STORY OF UNPARALLELED GENIUS, INTERMINABLE COURAGE, AND GENERAL AWESOMENESS

by

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## Dedication

To Wanda Maximoff:

Write as a block (or single paragraph) with no indentation. The dedication is optional. A dedication is an expression of friendly connection, gratitude, or thanks by the author towards another person or person(s). It may also be used to highlight a connection to a community or cause. Adapted from Wikipedia. The dedication has its own place on the dedication page and is part of the front matter.

## Abstract

Abstract to be less than 300 words. Write as a single block without indentation. The abstract is required. An abstract is a concise summary of your thesis. It should summarize your thesis, its results, and their broader relevance. It allows readers determine the relevance of your thesis for their own research. It also communicates your key findings to those who don’t have the time to read your entire thesis.

## Plain Word Summary

Plain word summary to be less than 300 words. The plain word summary is optional. Write as a single block without indentation. Write as a single block without indentation. A Plain Word Summary should convey the same information as the Abstract but in a different language and tone. It should summarize your thesis, its results, and their broader relevance without using jargon so that it is understandable by readers from outside of your discipline, as well as journalists and educators. The audiences include, but are not limited to, practitioners, policy makers, the public, and/or professionals in nearby disciplines.

## Acknowledgements

Write as a paragraph, or paragraphs, with indentation. The acknowledgements section is optional. I would like to extend my heartfelt thanks to the following entities, without whom this thesis would not have been possible. My alarm clock, for its unwavering commitment to disrupting my dreams at the most inconvenient times, ensuring that I never got too comfortable in my slumber. The coffee machine, which faithfully dispensed caffeine on demand, turning me into a jittery, sleep-deprived academic zombie during many late-night writing sessions. The endless stream of cat videos on the internet, which, while distracting, provided much-needed moments of respite from the grueling task of researching and writing. My neighbor's dog, who barked tirelessly at all hours of the day, serving as a reminder that sometimes life's challenges come in the form of non-human companions. The ghost of Albert Einstein, who may or may not have whispered the secrets of the universe to me during my late- night epiphanies. Though his contributions remain unverifiable, I'd like to think I owe him a nod of appreciation. Last but not least, the cosmic forces of the universe, for conspiring to bring together this strange amalgamation of elements and events, leading to the creation of this peculiar thesis. In conclusion, this thesis is a testament to the unpredictable, bizarre, and at times, maddening journey of academic pursuit. I am grateful for all the oddities and idiosyncrasies that contributed to its completion. I acknowledge the support of the graduate school for a travel grant in Fall 2022. I acknowledge the support of the National Science Foundation under grant 2012345.

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## Chapter 1: Introduction

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Figure 1.1: A capybara wearing a suit. Probably has an important meeting to get to.

# Chapter 2: Methods

## 2.1 Study System

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## 2.2 Mathematical Model

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$$\frac{\partial u_i}{\partial t} = \underbrace{D\nabla^2 u_i}_{\text{Random Motion}} - \underbrace{2\nabla[A_i \nabla u_i]}_{\text{Directed Motion}} \tag{2.1}$$

## 2.3 Statistical Model

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$$f(\boldsymbol{x}|\boldsymbol{y}, \theta_0) = \frac{\phi(\boldsymbol{x}|\boldsymbol{y}, \theta_0)\, \omega(\boldsymbol{x}, \boldsymbol{\beta})}{\int_\Omega \phi(\boldsymbol{x}'|\boldsymbol{y}, \theta'_0)\, \omega(\boldsymbol{x}', \boldsymbol{\beta})} \tag{2.2}$$

| Parameter | Interpretation | Dimensions |
|---|---|---|
| $\mathbf{x}$ | spatial location | [1x2] |
| $u_i(x,t)$ | individual territory | [1x1] (i=5) |
| $V_{hr}$ | vector field defining available space | [1x1] |
| $B(\mathbf{x})$ | perceptive range of individual | [1x12] |
| $s_j(x,t\|B(x))$ | Spatially averaged effect in perceptive range | [1x1] (j=4) |
| $B^C{}_{i,j}$ | effect of conspecific (from iSSA) | [5x5] |

Table 2.1: Model components and parameters making up advection diffusion model as well as biological interpretation in model's system.

## Chapter 3: Results

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### 3.1 Steady State Solution

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| | TET052 | TET030 | TET072 | TET062 | TET074 |
|---|---|---|---|---|---|
| TET052 | - | -0.3 | -0.1 | -0.1 | -0.14 |
| TET030 | -0.26 | - | -0.1 | -0.2 | -0.2 |
| TET072 | -0.1 | -0.1 | - | -0.13 | -0.1 |
| TET062 | -0.1 | -0.31 | -0.16 | - | -0.1 |
| TET074 | -0.13 | -0.21 | -0.1 | -0.1 | - |

Table 3.1: They all seem to be negative. Maybe that's significant? Maybe it's not. Why are a bunch of them 0.1?

### 3.2 Non-territorial Individual Analysis

Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, mo- lestie vitae,

placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend conse- quat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismodnunc eupurus. Donec bibendumquam in tellus. Nullamcursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.

## Chapter 4: Discussion

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## References

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## Appendix A: Supplemental Material

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Figure A.1: Frog looking real dapper.

## Appendix B: More Supplemental Material

Sed commodo posuere pede. Mauris ut est. Ut quis purus. Sed ac odio. Sed vehicula hendrerit sem. Duis non odio. Morbi ut dui. Sed accumsan risus eget odio. In hac habitasse platea dictumst. Pellentesque non elit. Fusce sedjusto eu urna porta tincidunt. Mauris felis odio, sollicitudin sed, volutpat a, ornare ac, erat. Morbi quis dolor. Donec pellentesque, erat ac sagittis semper, nunc dui lobortis purus, quis congue purus metus ultricies tellus. Proin et quam. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos hymenaeos. Praesent sapien turpis, fermentum vel, eleifend faucibus, vehicula eu, lacus.