

# Contents

---

## **Introduction | 9**

- Intuitive by Design | 10
- The Objects of Study | 13
- A Note on Interdisciplinarity | 23
- Structure and Contents of the Study | 26
- The Limits of the Study | 28

## **BRAIN TIME IN VIRTUAL SPACE**

### **The State Machine and the Present Moment | 33**

- Apparent Motion | 34
- The State Machine | 38
- Three Moments in Time | 40

### **Structuring Gametime | 53**

- Change of State | 55
- Space-Time | 64
- Conditions | 76
- Going Forward | 84

### **Cause, Effect, and Player-Centric Time | 85**

- “We’re All Puppets, Laurie” | 86
- Causal Illusions | 87
- Causation in Language | 88
- Force Dynamics and Intuitive Psychology | 92
- Causation in Video Games | 93

## **ITERATION IN VIRTUAL SPACE**

### **Predictive Thinking in Virtual Worlds | 101**

- The Bayesian Brain | 103
- Bayesian Inference in Visual Perception | 104
- Bayesian Inference in Movement | 109
- Coping with Uncertainty | 111

## **The Groundhog Day Effect | 115**

The Groundhog Day Effect in Jesper Juul’s Time Mapping | 118

A Temporal Paradox | 121

Solutions to the Paradox | 123

“Once Wasn’t Enough for You, Eh? Well, Twice Is Fine by Me!” | 135

Lather, Rinse, Repeat | 138

## **The Hybrid Narrator | 139**

The Retrospective Narrator | 140

The Real-Time Narrator | 142

The Hybrid Narrator | 146

Finding a Balance | 153

# **THROUGH THE TEMPORAL LANDSCAPE**

## **The Speed of Time | 159**

Mediated Speed of Time | 161

Predictive Processing and the Speed of Time | 163

Bullet Time and the Experience of Dangerous Situations | 165

Flow | 169

## **Marshmallows and Bullets | 175**

Resident Evil: The Mechanics That Defined Survival Horror | 179

The Aesthetics of Self-Control | 185

## **Chekhov’s BFG | 191**

Chekhov’s Gun | 193

Visions of the Future | 194

False Expectations | 197

## **Conclusion | 205**

The Time We Want | 207

## **Acknowledgements | 211**

**References** | 213

Bibliography | 213

Online Resources | 224

Games | 227

Films | 231

Videos | 231

Comic | 232

