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A05 Analyzing "Arrival" Through the Lens of NLP

Introduction

In studying artificial intelligence, we often focus on algorithms and data structures, but *Arrival (2016)* reminded us that communication itself is a complex system worth analyzing. The story follows linguist Louise Banks as she attempts to interpret an alien language that challenges her perception of time and meaning. Through this lens, we began to recognize how the film reflects many of the same challenges faced in natural language processing, including ambiguity, context dependency, and the difficulty of translating meaning across different systems of understanding.

Knowledge Gained

From an academic perspective, Arrival illustrates the process of learning and interpretation that underlies AI systems. The aliens' circular writing system represents a language without a clear beginning or end, showing that meaning can be multidimensional. Louise's approach to deciphering these symbols resembles how NLP models learn patterns through exposure and contextual analysis.

We learned that context is essential to comprehension in both linguistics and artificial intelligence. As Louise begins to perceive the language holistically, she also begins to understand time differently. In the same way, deep learning models such as transformers process entire sequences simultaneously to capture relationships that earlier, rule-based systems could not. The film demonstrated how deeper context awareness leads to greater understanding and adaptability, which parallels how advanced NLP architectures operate today.

Application

We connected the film's approach to our own work in natural language processing. When Louise begins communication by writing the word "HUMAN," it mirrors the early stages of supervised learning, where labeled data forms the foundation of understanding. Each iteration of her communication with the aliens represents another layer of model training, gradually reducing uncertainty.

In one of our projects, we analyzed customer behavior data and initially structured it linearly. This approach limited insight into how behaviors actually repeated or overlapped. After revisiting the ideas presented in *Arrival*, we began to view the data cyclically, focusing on recurring patterns rather than fixed sequences. This shift revealed connections we had previously missed and helped us appreciate how flexible, non-linear thinking can enhance both human analysis and machine learning.

Reflection

What resonated with us most was how *Arrival* portrays intelligence as a process of comprehension and empathy. Louise's success depended on patience and observation,

qualities that parallel effective AI development. Her understanding of the alien language changed the way she perceived the world, just as exposure to new data can alter the perspective of an AI system.

The film also reminded us that the structure of a language shapes how its users interpret reality. In AI, data has the same influence: it defines how systems understand and respond to the world around them. For us, Arrival represents an exploration of understanding itself. It emphasizes that communication, whether human or artificial, depends on shared context and a willingness to perceive information from new angles.