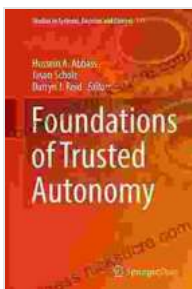


# Foundations of Trusted Autonomy Studies in Systems Decision and Control 117

Trusted autonomy is a critical aspect of systems decision and control, as it allows systems to operate independently while still ensuring that they are trustworthy and reliable. The study of trusted autonomy is a relatively new field, but it has rapidly gained importance due to the increasing use of autonomous systems in a variety of applications, such as self-driving cars, drones, and medical robots.

In this article, we will provide a comprehensive overview of the foundations of trusted autonomy studies in systems decision and control. We will begin by defining trust and discussing the different types of trust models. We will then discuss the evaluation of trust, and finally, we will provide some concluding remarks.

Trust is a complex concept that has been studied by philosophers and psychologists for centuries. In the context of systems decision and control, trust can be defined as the belief that a system will behave in a way that is consistent with the expectations of the user.



## Foundations of Trusted Autonomy (Studies in Systems, Decision and Control Book 117) by Hussein A. Abbass

★★★★☆ 4.4 out of 5

Language : English  
File size : 7592 KB  
Text-to-Speech : Enabled  
Screen Reader : Supported  
Enhanced typesetting : Enabled  
Print length : 610 pages



There are two main types of trust:

- **Cognitive trust** is based on the user's knowledge and understanding of the system. This type of trust is often built over time, as the user gains experience with the system and learns to predict its behavior.
- **Emotional trust** is based on the user's feelings and emotions towards the system. This type of trust is often based on the user's personal experiences with the system, as well as the user's expectations and beliefs about the system.

There are a variety of different trust models that have been proposed in the literature. These models differ in their assumptions about the nature of trust, the factors that influence trust, and the way that trust is evaluated.

Some of the most common trust models include:

- **The rational trust model** assumes that trust is based on a rational assessment of the costs and benefits of trusting a system. This model suggests that users will only trust a system if they believe that the benefits of trusting the system outweigh the costs.
- **The emotional trust model** assumes that trust is based on the user's feelings and emotions towards the system. This model suggests that users will trust a system if they have a positive emotional connection to the system.

- **The cognitive trust model** assumes that trust is based on the user's knowledge and understanding of the system. This model suggests that users will trust a system if they believe that they understand how the system works and how it will behave.

The evaluation of trust is a critical aspect of trusted autonomy studies. In order to ensure that systems are trustworthy and reliable, it is important to be able to measure and evaluate trust.

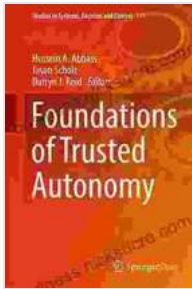
There are a variety of different methods that can be used to evaluate trust. These methods include:

- **Subjective evaluation** involves asking users to rate their level of trust in a system. This method is simple and straightforward, but it can be biased by the user's own personal experiences and beliefs.
- **Objective evaluation** involves measuring the system's behavior to determine if it is trustworthy. This method is more objective than subjective evaluation, but it can be more difficult to implement.
- **Mixed evaluation** combines subjective and objective evaluation methods. This method can provide a more comprehensive evaluation of trust than either method alone.

Trusted autonomy is a critical aspect of systems decision and control. In this article, we have provided a comprehensive overview of the foundations of trusted autonomy studies. We have defined trust, discussed the different types of trust models, and discussed the evaluation of trust.

The study of trusted autonomy is a relatively new field, but it is rapidly gaining importance due to the increasing use of autonomous systems in a

variety of applications. As the field continues to grow, we can expect to see new and innovative approaches to trusted autonomy studies.

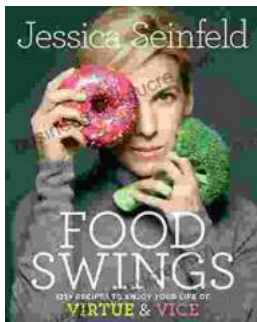


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