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# Safe Reinforcement learning: An application to autonomous systems

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## Résumé

The growing demand for robust, stable, and adaptive control techniques has been particularly evident in the autonomous systems control and navigation domains. While numerous techniques and algorithms have been proposed in the literature for application in autonomous systems, these algorithms are predominantly model-based and offline. Consequently, the existing online, model-free methods lack a comprehensive architecture capable of addressing the control and navigation challenges.

The primary objective of this thesis is to formulate and formalize Deep Reinforcement Learning (DRL) based control and navigation architectures that can be implemented online, in a model-free manner. These architectures should also incorporate considerations for system battery degradation, fault detection, and failure prediction.

**Mots-Clés:** Safe Reinforcement learning, Neural Networks, Autonomous systems

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