# Adaptive Critic Designs For Optimal Control Of Power Systems

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### Adaptive Critic Designs For Optimal

In 1970s, adaptive critic designs (ACDs) were first introduced as effective tools to approximately solve the optimal control problems Werbos (1974), Widrow et al. (1973).

### Adaptive critic designs for optimal control of uncertain ...

Adaptive critic designs for optimal control of ... are described and the results show the successful control of the power system elements and the entire power system with adaptive and optimal ...

**(PDF) Adaptive critic designs for optimal control of power ...**

In this paper, the optimal control scheme for ice storage air conditioning system is solved via an adaptive critic design method. Adaptive critic design is also called adaptive dynamic programming (ADP). First, the operation of the air conditioning system is analyzed. Next, adaptive critic method is designed to realize the optimal control for the air conditioning system. Numerical results show that using the data-based ADP optimal control method can reduce the operation costs.

**Adaptive Critic Designs of Optimal Control for Ice Storage ...**

Adaptive critic designs Abstract: We discuss a variety of adaptive critic designs (ACDs) for neurocontrol. These are suitable for learning in noisy, nonlinear, and nonstationary environments. They have common roots as generalizations of dynamic programming for neural reinforcement learning approaches.

**Adaptive critic designs - IEEE Journals & Magazine**

Adaptive Critic Designs For Optimal In 1970s, adaptive critic designs (ACDs) were first introduced as effective tools to approximately solve the optimal control problems Werbos (1974), Widrow et al. (1973). The typical structure used in ACDs is the actor-critic

**Adaptive Critic Designs For Optimal Control Of Power Systems**

A. Adaptive Critic Desings A family of ACDs was proposed by Werbos as a new optimal control technique combining the concepts of reinforcement learning and approximate dynamic programming [20]. The ACD technique uses a neural network, namely the critic network, to approximate the cost-to-go function in the

**Adaptive Critic Design based Dynamic Optimal Power Flow ...**

The increasing complexity of the modern power grid highlights the need for advanced modeling and

control techniques for effective control of excitation, turbine and flexible AC transmission systems (FACTS). The crucial factors affecting the modern power systems today is voltage and load flow control. Simulation studies in the PSCAD/EMTDC environment and realtime laboratory experimental studies ...

**Adaptive critic designs for optimal control of power systems**

areas of optimization and optimal control. Based on one of these modifications, we present a unified approach to all ACD's. This leads to a generalized training procedure for ACD's. Index Terms— Adaptive critic design (ACD), backpropagation, control, DHP, dynamic programming, GDHP, HDP, heuristic

**Adaptive Critic Designs**

The neural network identification scheme is combined with the traditional adaptive critic technique, in order to design the nonlinear robust optimal control under uncertain environment. First, the robust optimal controller of the original uncertain system with a specified cost function is established by adding a feedback gain to the optimal controller of the nominal system.

**Data-Based Adaptive Critic Designs for Nonlinear Robust ...**

Adaptive critic designs can be used to solve nonlinear optimal control problems, without posing restrictions on the form of the dy-namic equation or the controller a priori. By approximating the DP solution forward in time, they can learn the optimal control law both off and online. When plant dynamics and uncertainties are captured

**Online Adaptive Critic Flight Control**

In this paper, an adaptive critic design (ACD) approach is proposed to control the phase and voltage of a grid-connected virtual synchronous generator…

**Adaptive critic design-based reinforcement learning ...**

In this article, a novel neural network (NN) optimal control approach using adaptive critic designs is developed for nonlinear discrete-time (DT) systems with time delays. First, to eliminate the delay term of control input, a time-delay matrix function is developed by designing a M network.

**A novel neural network discrete-time optimal control ...**

This book reports on the latest advances in adaptive critic control with robust stabilization for uncertain nonlinear systems. Covering the core theory, novel methods, and a number of typical industrial applications related to the robust adaptive critic control field, it develops a comprehensive framework of robust adaptive strategies, including theoretical analysis, algorithm design ...

**Adaptive Critic Control with Robust Stabilization for ...**

Adaptive critic designs for discrete-time zero-sum games with application to H(infinity) control. Al-Tamimi A, Abu-Khalaf M, Lewis FL. In this correspondence, adaptive critic approximate dynamic programming designs are derived to solve the discrete-time zero-sum game in which the state and action spaces are continuous.

**Adaptive critic designs for discrete-time zero-sum games ...**

Then, a recurrent neural network (RNN) and adaptive critic designs (ACDs) are employed to solve the derived event-triggered nonlinear optimal control problem. The RNN is applied to reconstruct the system dynamics based on collected system data.

**Adaptive Critic Designs for Event-Triggered Robust Control ...**

In this study, an adaptive critics design based on a support vector machine (SVM) is adopted to

design a finite-horizon optimal feedback controller. The adaptive critics design consists of actor and critic networks. The actor (control input) and critic (cost-to-go) network are trained off-line with respect to various initial states and final ...

**Adaptive Critics Design with Support Vector Machine for ...**

Besides, the DMS regulates BESS state of charge and bus voltages within their limits. It also controls loading of branches by taking corrective measures during overloading or preventive measures during critical loading conditions. This DMS has been designed using a reinforcement learning based technique, namely, adaptive critic design (ACD).

**IET Digital Library: Reducing the risk of cascading ...**

The authors begin by introducing the mathematical background of model-reference adaptive critic designs. Various ADP designs such as Heuristic Dynamic Programming (HDP), Dual HDP (DHP), Globalized...

**Model-based Adaptive Critic Designs | Request PDF**

1. Origins of adaptive critic designs: reinforcement learning, dynamic programming, and backpropagation Reinforcement learning has been acknowledged by physiologists since the time of Pavlov [1], and has also been a major focus for the neural network community [2], [3]. At the time of