SC42050 Literature Assignment

Fuzzy controller for measuring blood pressure

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Description

This assignment concerns the description of a fuzzy controller for measuring instantaneous arterial blood pressure, described by Lin et al. (2008).

Questions

1. Describe concisely the main idea of the approach used.
2. Why is a fuzzy controller considered?
3. Can you propose another TS approximation of the model (6)?
4. The local models are given on pg. 45. What may happen if the controller and observer gains are computed for these models and not by solving the LMIs on pg. 44?
5. Do you agree with the authors' solution to compensate the time lag in each mode? Motivate, or try to give a possible alternate solution.
6. Give examples for other applications where fuzzy models (controller/observer) are used. What is common in these applications?
7. In Section 2.4 the observer/controller design is described. In order to write the observer rule and equation (10), the authors made an assumption that is not explicitly stated in the paper. What is this assumption?

References

Lin, A.-Y., Huang, H.-N., Su, Y.-C., Shiu, C.-Y., and Hwang, J.-L. (2008). Implementation of fuzzy controller for measuring instantaneous arterial blood pressures via tissue control method. *IET Control Theory & Applications*, 2(1):40–50.