

University of Groningen

Contract theory for linear control systems

Shali, Brayan

DOI:
[10.33612/diss.830800648](https://doi.org/10.33612/diss.830800648)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2023

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Shali, B. (2023). *Contract theory for linear control systems*. [Thesis fully internal (DIV), University of Groningen]. University of Groningen. <https://doi.org/10.33612/diss.830800648>

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

Propositions

accompanying the dissertation

Contract theory for linear control systems

by

Brayan M. Shali

1. Explicitly incorporating knowledge about the environment of a system can relax its design constraints. (*Chapter 2*)
2. The assumptions express the expected behaviour of the environment, while the guarantees express the desired behaviour of the system. (*Chapter 2*)
3. The meta-theoretic definitions of refinement and composition are tailored to enable modular design and analysis. (*Chapter 2*)
4. The consistency of a behavioural contract is not guaranteed because implementations are restricted to be in input-output form. (*Chapter 3*)
5. The assumption of well-posedness for the feedback interconnection allows one to determine its behaviour based on the contracts that its components implement. (*Chapter 4*)
6. The geometric characterization of simulation allows one to incorporate control design in the contract framework. (*Chapter 5*)
7. The characterizations of refinement and series composability for simulation contracts are analogous to the ones for behavioural contracts despite the fact that simulation is stronger than behavioural inclusion. This is because simulation contracts allow implementations to be nondeterministic. (*Chapter 5*)
8. Perfect is the enemy of good.
9. Good notation is in the eye of the beholder.
10. Nothing is certain except death, taxes, and the rising costs of canteen soups.