

Formal Methods – An Appetizer

Motivation and Introduction

02141 Formal Methods

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What Formal Methods Can Do

KEVIN HARTNETT SCIENCE 09.23.16 09:00 PM

COMPUTER SCIENTISTS CLOSE IN ON PERFECT, HACK-PROOF CODE



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A team of hackers is to take control of *Little Bird* – a drone similar to the helicopters used by US special operations.

The hackers had a head start:

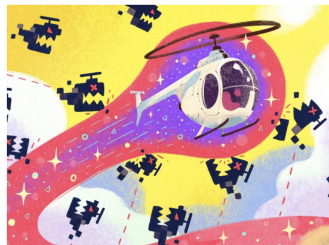
- They were given access to the interface of the drone's computer system.
- From there, all they needed to do, was hack into *Little Bird's* onboard flight-control computer, and the drone was theirs.

When the project started, the hackers could take over the drone almost as easily as they could break into your home Wi-Fi.

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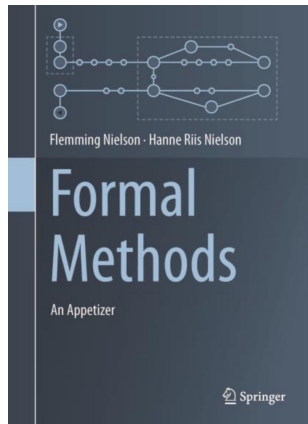
Read the story on the web.

Engineers from the *Defense Advanced Research Projects Agency* enhanced the drone's software.

- They implemented a new kind of security mechanism – a software system that couldn't be commandeered.
- Key parts of *Little Bird's* computer system became un-hackable with existing technology.

Even though the hackers were given six weeks with the enhanced drone, they failed to crack *Little Bird's* defenses.

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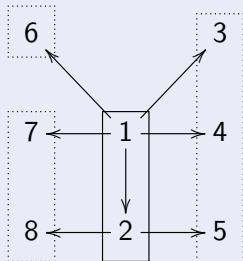
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Program
Graphs
Guarded
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Language-
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Checking
Procedures
Concurrency

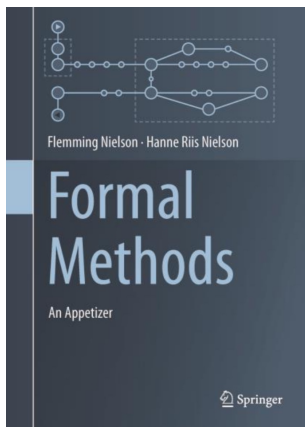
Reading the book

- Start with Chapters 1 and 2.
- Read Chapters 3 – 8 as you like.

Dependencies (FM_{pV})



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Springer, ISBN 9783030051556.

Chapter by chapter

- Watch **FormalMethodsDK** on YouTube.
- Read the sections one by one – doing the Try It Out on the way.
- Do the Exercises as you like – and perhaps try some Teasers.
- Play with the systems at **FormalMethods.dk** – making your own examples on the way.