Graph Algebra and Formally Defined Programs in Z

Using Haskell to Reason and Verify Programs

Leonard Kleinrock

01.jan.2022

Formal Methods International Congress

Graph Algebra Representation of Formally Defined Programs in Z

Using Haskell to Reason and Verify Programs

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Lists

1 Berlin

2 Hannover

3 Freiburg im Breisgau

4 Heidelberg

5 Hamburg

1 Leipzig

2 Dresden

3 München

4 Köln

5 Köningsberg und Praga

Is Algebraic Graph Knowledge Possible?

Research has been conducted in order to evaluate the possibility of reaching meaningful knowledge from Algebraic Graph transformations.

- Model Cheking and theorem prooving are viable paths.

When the neet to make strong assertions becomes inevitable:

- This is the first way: outstanding assertion !
- Even greater impact comes from: **hilight text** !

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* **Note** : This is a very long footnote line intended to test the layout of two lines.

H1

H2

H3

H4

H5

H6

- This is a fragment o normal text written here in order to exemplify the use of several featrues in CSS.
- This is a fragment o normal text written here in order to exemplify the use of several featrues in CSS.
  - This is one feature
  - This is another subjetc.

Lists

1. One

2. Two

3. Three

    i. abc

    ii. def

4. End of list

```haskell
primes = filterPrime [2..]
  where filterPrime (p:xs) =
          p : filterPrime [x | x <- xs, x `mod` p /= 0]

seqLength :: Num b ⇒ Sequence a → b
seqAppend :: Sequence a → Sequence a → Sequence a

seqLength Nil = 0
seqLength (Cons _ xs) = 1 + seqLength xs

seqAppend Nil ys = ys
seqAppend (Cons x xs) ys = Cons x (seqAppend xs ys)
```

Code: Haskell code fragment.

Tables

Column A	Column B	Column C	Column D
A1	B1	C1	D1
A2	B2	C2	D2
A3	B3	C3	D3

Table: Exemple of use of tables.

LaTeX Equations
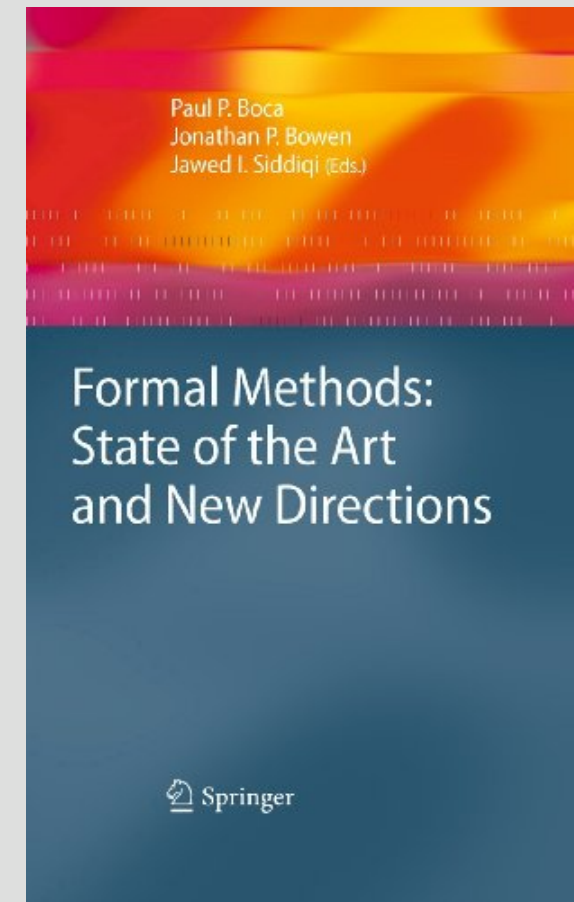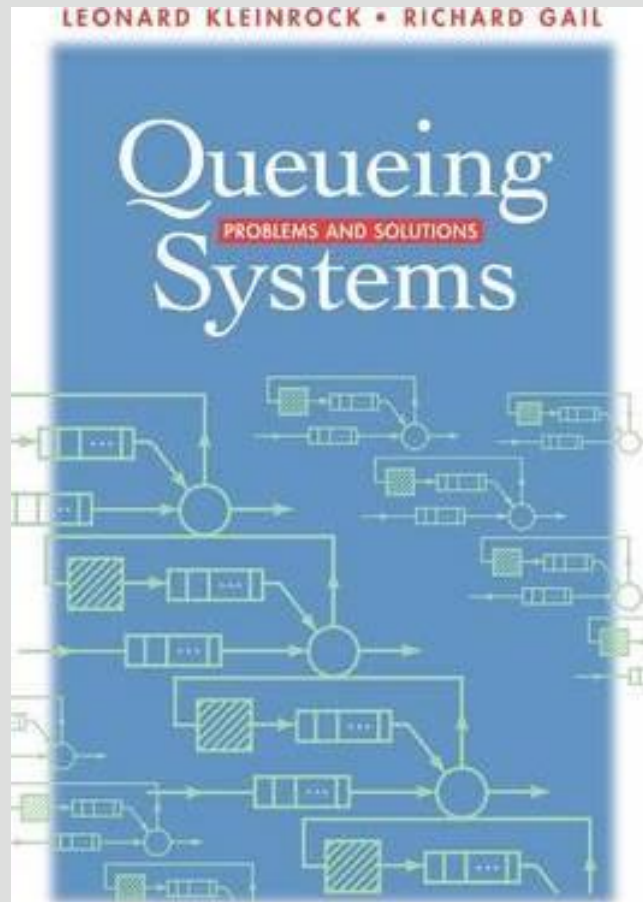
$$\frac{1}{c^2}\frac{\partial^2\psi}{\partial t^2} = \nabla^2 \circ \psi$$

$$\nabla \times \mathbf{E} = -\frac{\partial \mathbf{B}}{\partial t}$$

$$\nabla^2 \mathbf{E} = \mu\epsilon \frac{\partial^2 \mathbf{E}}{\partial t^2}$$

$$c = \sqrt{\frac{1}{\mu\epsilon}}$$

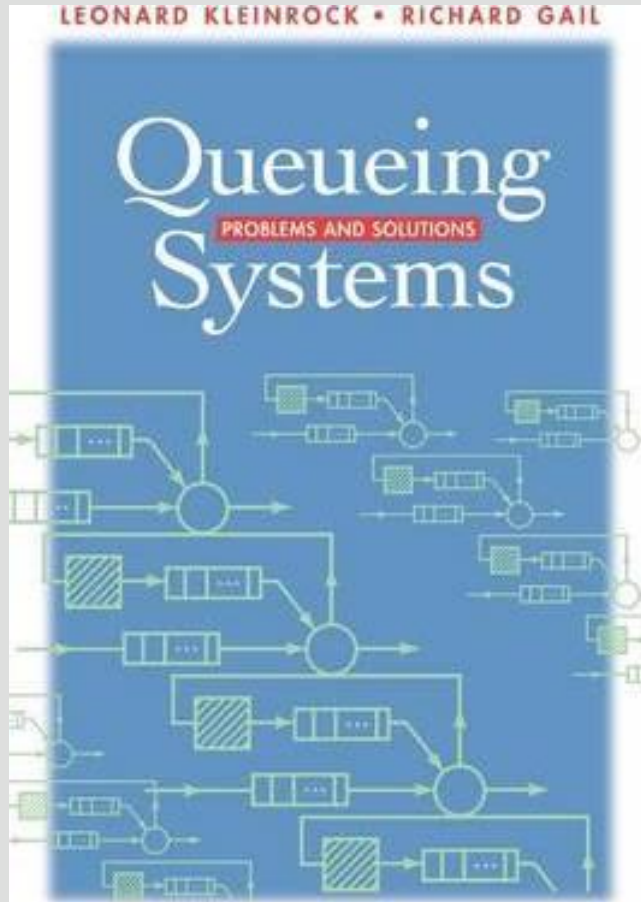# Images in Two Columns

Images in Two Columns
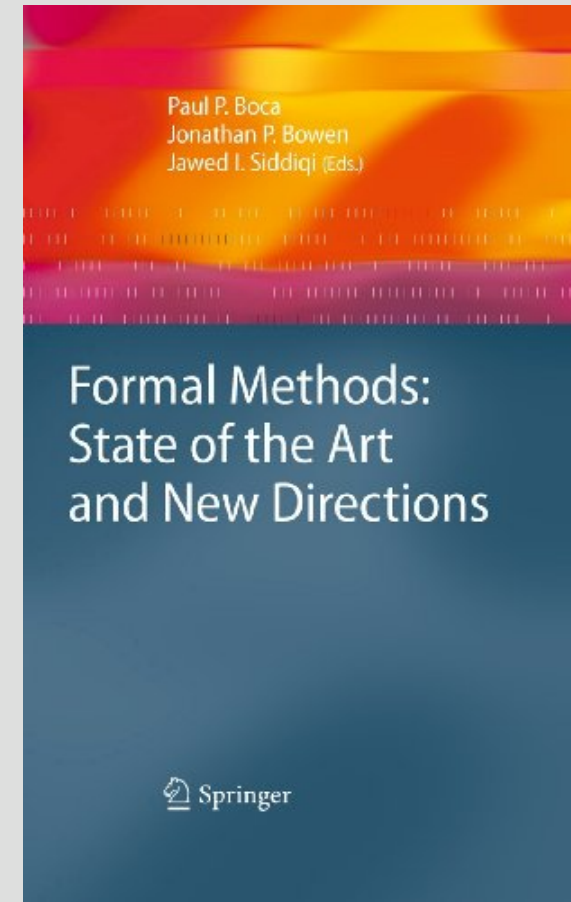

Figure: Kleinrock, Gail (1979).

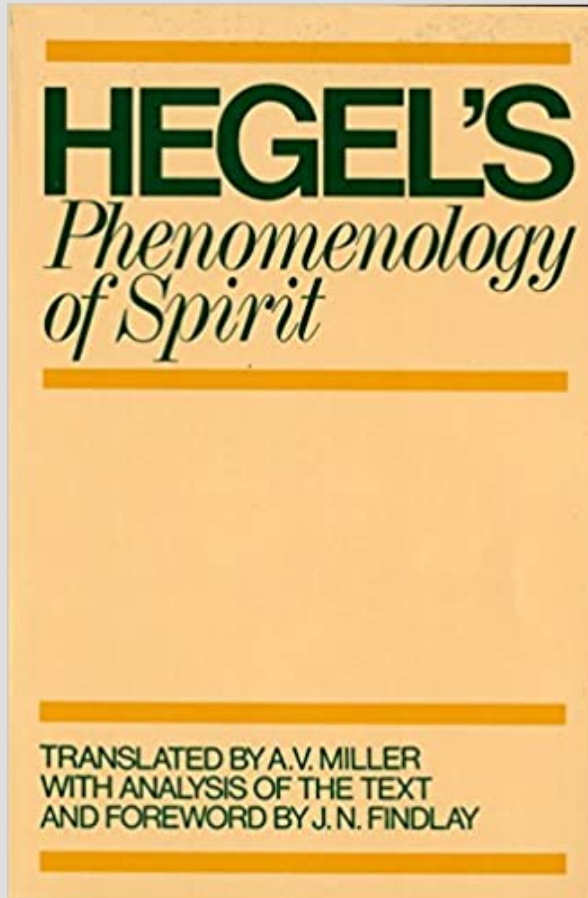**Figure**: Springer Verlag (1979).

Image and text

Figure: Oxford edition (1979).

Hegel's Phenomenology

The book was originally entitled "Phänomenologie des Geistes" by its author, G.W.F. Hegel.

- Published in 1807, marked a significant development in German idealism after Kant.

- In this book Hegel develops his concepts of dialectic.

Price at Amazon: $ 17.83

"There is an **increasing** demand of current information systems to incorporate the use of a higher degree of formalism in the development process. **Formal Methods** consist of a set of tools and techniques based on mathematical model and formal logic that are used to **specify and verify** requirements and designs for hardware and software systems."

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- Mona Batra -

Transition Slide

References

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