Software Engineering

Roots

Michael L. Collard, Ph.D.

Department of Computer Science, The University of Akron

Pre-History of Software Engineering

- Edsger W. Dijkstra

- David Parnas

- Fred Brooks

- Margaret Hamilton

Go To Statement Considered Harmful

Key Words and Phrases: go to statement, jump instruction, branch instruction, conditional clause, alternative clause, repetitive clause, program intelligibility, program sequencing
CR Categories: 4.22, 5.23, 5.24

EDITOR:

For a number of years I have been familiar with the observation that the quality of programmers is a decreasing function of the density of go to statements in the programs they produce. More recently I discovered why the use of the go to statement has such disastrous effects, and I became convinced that the go to statement should be abolished from all "higher level" programming languages (i.e. everything except, perhaps, plain machine code).
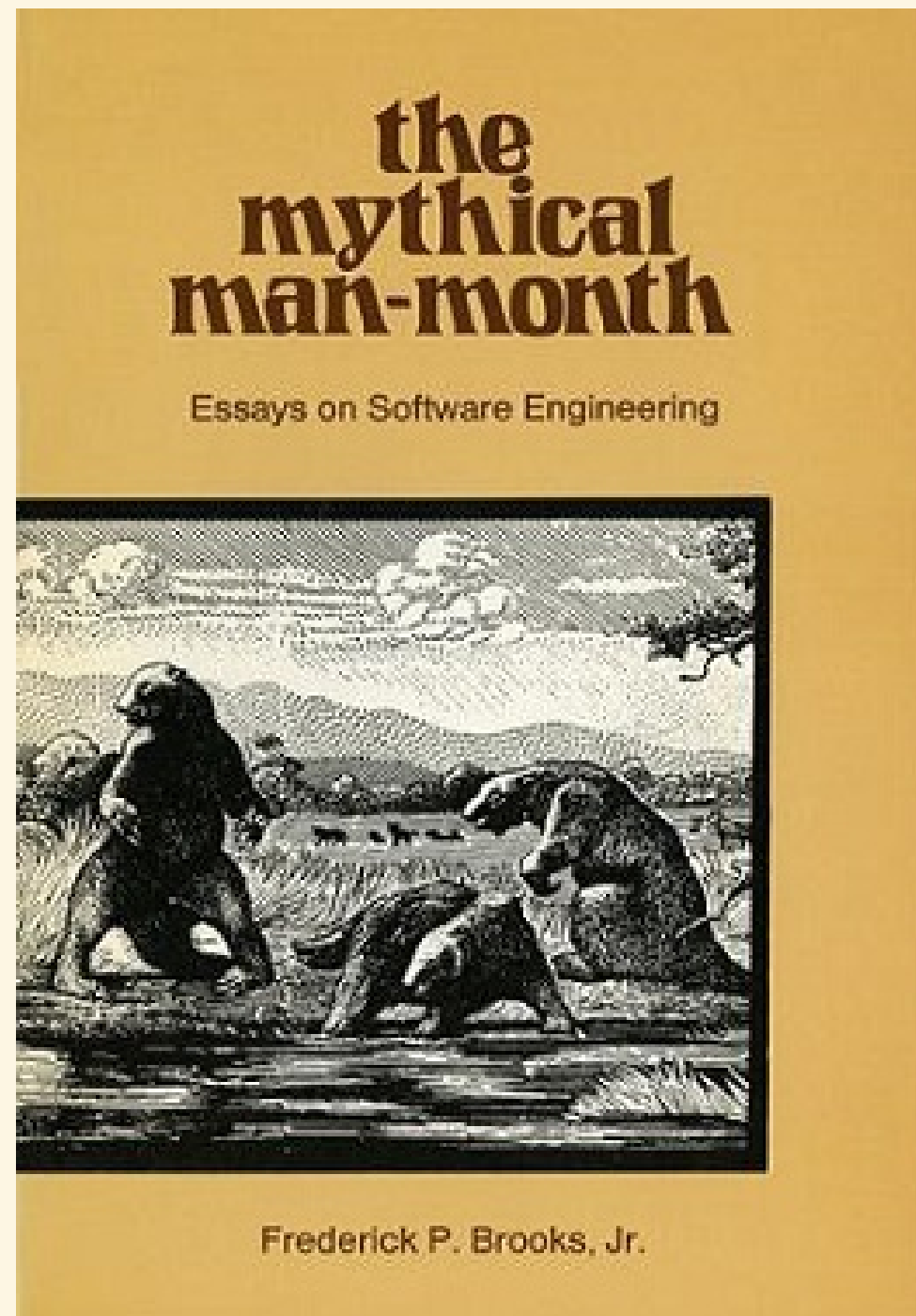
- Known for the shortest path "Dijkstra's algorithm."

- Advocated for structured programming and was a critic of the GOTO statement.

- His famous letter, Go To Statement Considered Harmful, influenced the debate on programming practices

Programs, like people, get old. We can't prevent aging, but we can understand its causes, take steps to limit its effects, temporarily reverse some of the damage it has caused, and prepare for the day when the software is no longer viable. … (We must) lose our preoccupation with the first release and focus on the long term health of our products.

- Introduced the concept of information hiding in modular programming, which remains a core principle in software design

- Advocated for the use of precise specifications and documentation in software design

- Early proponent for the concept of *software evolution*

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the
mythical
man-month

Essays on Software Engineering

Frederick P. Brooks, Jr.

- Managed the development of IBM's System/360 family of computers and the OS/360 software.

- Authored "The Mythical Man-Month," which discussed the challenges of large software projects and introduced concepts such as "adding manpower to a late software project makes it later."

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Margaret Hamilton

- Led the team that developed the onboard flight software for NASA's Apollo program, used for the Apollo 11 moon landing in 1969

- Coined the term "software engineering" to emphasize the complexity and importance of software development similar to traditional engineering

- Introduced the concepts of asynchronous software, priority scheduling, and human-in-the-loop decision capability

- Emphasized the importance of rigorous testing in simulation environments

- Credited with establishing the foundation for modern software development processes

- One of the members in the Women of NASA Lego Set

"Software Engineering"

- Definition

- Software Crisis

Do we still have a software crisis?

- Delays

- Quality Issues

- Abandoned projects

- Overall, real money

Goals

Process

Methods

Tools