

Miser Project Synopsis

Sunday, November 24, 2019 2:42 PM

Clipped from: <http://miser-theory.info/synopsis.htm>



Notes Folio n011101 Miser Synopsis Concepts Original Synopsis

miser>notes>
2001>11>

n011101c>
0.0.3 2019-11-24 14:15

- **Latest version:** The latest Miser Synopsis presentation is at <http://miser-theory.info/notes/2001/11/n011101b.htm>.
- **This page:** 0.0.3 Original Synopsis <http://miser-theory.info/notes/2001/11/n011101c.htm>. This is the synopsis that has been stable for several years and is preserved here as the basis for further elaboration.
- **PDF Preservation** <https://orcmid.github.io/miser/synopsis/Miser-0.0.3-synopsis.pdf>
- **GitHub Replica:** <https://orcmid.github.io/miser/synopsis>

The *Miser Project* is a practical exploration of key concepts at the foundation of computer science.

Project elements demonstrate the fundamental nature and simplicity of computation. From that simple foundation, operational implementations of computer programs are created, at first using a simple processing language (*Frugal*), that demonstrate the clear possibility of elegant, consistent computational systems of great power based on elementary but rigorous foundations.

The project begins by formulating and then constructing a simple, well-defined and easily-analyzed family of computational mechanisms, the *Miser Engines*. The progression of Miser engines makes clear where gains in power are available and where the limitations of computation are inescapable. A key objective is investigation of computational regimes that interact in/worlds "outside/beyond" themselves.

The basic data elements of Miser are different from the structures used in conventional programming systems. These elements, the *Miser Obs*, are similar to those of Lisp and other list-processing languages, although Miser is not Lisp.

This choice of initial elements supports seven project themes:

1. Universality

having from the very beginning an elementary structure that is completely sufficient as a basis for (representing) all computations of any kind

2. Completeness

providing direct access to and demonstration of the notion of computational completeness

3. Interpretation

contrasting with familiar computational entities (and their representations) so that we can see more clearly what is essential and what is inessential in the implementation and interpretation of computational entities

4. Representation

strengthening our grasp on what it means to represent something in a computer system

5. Extensibility

demonstrating a computational system's capacity for integrating extensions to its internal representations while preserving amenability of the system to theoretical analysis

6. Fidelity

confirming an implementation's fidelity to a *theoretical model*

7. Realization

mechanizing the mechanism's theoretical model in the computational system itself

The *Miser Project* is an activity of independent scholarship, using the Web as a vehicle for communication and collegial discussion. Many of the topics are unfolded as individual web pages and in diaries and notes that become the annotations and history of the latest thinking reflected in the web pages. All of the work is available for use and redistribution/publication under a simple open-source license.

Work on Miser was begun around 1978, but not taken beyond a clumsy prototype implementation on a Heathkit H8 computer system. Lately, I began to see how my perspective has progressed even while I was not thinking about it very much. Miser provided me with useful insights into much of what lies mostly unrecognized and untapped beneath the significant computational power that we have available today. This leads me to once again take up Miser and use it as a vehicle for exploring the heart of computation, computer science, and computers as linguistic devices.

This work was inspired by what I learned in the company of computer scientists Bill Burge and Peter Landin. It was the unswerving commitment of Bob Bemer to a vision of software piece parts and re-usability that brought this particular combination together. It opened a new world for me. Christopher Strachey, who I had met only briefly, provided a major inspiration. I am particularly thankful to having been around for the initial blossoming and flourishing of ALGOL 60 and the continuing inquiry into computer science that emerged with that magnificent instrument.

I am indebted to conversations with Alan Camhi for my return to this work. Alan, this is the beginning that I promised to make.

-- Dennis E. Hamilton
Livorno, Italy
2000 May 7

0.0.3 2019-11-24-13:50 Correct and Extend the Version Progression

Incorrect links to versions are repaired and the replica on GitHub and the PDF are included. The title is improved.

0.02 2014-03-28-13:19 Transpose Into Folio Structure

The accession-numbered version is transposed further into a folio structure. Further development will be in subsequent pages in this and other folios.

0.01 2002-03-03-11:22 Version

This version is the synopsis as refined in the subsequent 21 months. There are no further changes to the 2002-02-24 content. This note has been edited to have identification as a historical version. Any further revisions will be to introduce links and format adjustments. There are to be little or no further changes to the content. The main alteration is employment of the accession-numbering system that I had settled upon for notes.

0.00 2000-05-07-13:42 Version

This version of the synopsis is a snapshot of the original 2000-05-07 version posted from Livorno, Italy,.



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