

# A Look at FORTH's Academic Standing

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## Abstract

In this paper we look at the problems affecting the academic acceptance of FORTH. We take stock of its current standing, and the perceived current prejudices.

In the current era of accountability, academics find it difficult to justify being involved in, or even interested in FORTH. We make two suggestions as to how this may be rectified.

As FORTH gains more general acceptance it is seen that some form of control over the standard of FORTH programmers will be required. The idea of a controlling body is outlined.

The intention of this paper is to *provoke discussion* within the community about the problems outlined.

## 1 The Past

FORTH has suffered from the attitude that it is a “hackers” language. In certain circles this has proved to be an advantage, however, it has slowed the academic acceptance of FORTH considerably. The main reason for people holding this attitude relates back to the early days when EFIG/FIG released their portable public domain system. Software houses/managers took one look at this hodge-podge of ideas and pre-standard code before either becoming engrossed in the idea or dropping it like a hot brick. Now when we talk of FORTH, this is what they remember. We are well aware that FORTH has moved on greatly since those days. A simple look at the new ANSI Standard [ANS93] shows this quite clearly. Yet the software managers still have this pre-'78 idea of FORTH!

This must be changed if FORTH is to gain any standing as a language. Fortunately this has indeed been happening, but only by stealth. I.e. Hiding FORTH

inside other products such as VP-Planer [Bro90], the Open Boot ROM [Bra92], and similar projects.

Many people still regard FORTH as a “write only” language. This mainly comes from the constraints of the Block (or Screen) and perceived lack of comments. However, the block system probably encourages more structure and documentation than other so called normal (imperative) languages. The average manager does not see the shadow (or comment) block, this is not helped by some programmers, not supplying comment blocks!

Chapter 11 of the ANSI Standard outlines a file interface that should totally overcome this outdated criticism. Unfortunately the move to file base systems will bring with it the bad habits found with these other languages. Ie. The code will start to become less documented, with people relying on the file layout. The file structure will encourage larger, less generalised code fragmentation. For examples of bad fragmentation and limited documentation, just look at any file based compiler (such as C, Pascal or ADA).

Software managers tend to see only the (mostly badly documented) code. They do not appreciate that FORTH is not just another programming language, but rather a philosophy of programming [Bro84]. Many ideas currently in favor (such as structured programming, reuseability, libraries, etc.) generally known as “Software Engineering” have been available and used in FORTH for many years [Bro82, Bro84].

Because of its involvement with the distribution of public domain FORTH systems in the '70s, the FORTH Interest Group has been permanently associated with the early “hackers” attitude to FORTH. FIG now has the status of a simple user group. The idea of releasing a common base into the public domain was a very ambitious one, and before its time. As the electronic distribution and discussion of the ANSI Standard was breaking new ground. FIG was one of the leaders in this kind of marketing, unfortunately it failed to keep peoples interest, or come out with new packages. Thus aided its own destruction by promoting the general feeling that FORTH has not progresses since FIG-FORTH. Fortunately both the FORTH community, and others, have learned the lessens of this disaster. This form of marketing is being used with grate success by other organisations, such as the Free Software Foundation (FSF).

## 2 The Present

FORTH is slowly gaining some respectability. Now that we finally have an ANSI Standard, it will go a long way to improving FORTH’s standing in many manager’s eyes. The “portability” aspect of the standard should not be ignored. This is one area where FORTH has been lacking. The standard not only addresses this problem but actively encourages the development of portable programs!

As previously stated, there are many projects using FORTH in the underling architecture. However, the companies involved do not wish their involvement

with FORTH to become public knowledge. There are generally two reasons for this: (a) they consider this to be commercially sensitive information; or (b) their software managers think they will be criticised and belittled for making what was, apparently, an intelligent production decision.

Many FORTH-like development languages have been developed by different organisations. The Ten15 Development Language (TDL) being the most important of these. This has now been adopted as the “Architecture Neutral Distribution Format” (ANDF) development target language for the Open Systems Foundation (OSF) [OSF91]. Although the basic ideas and principals of the ANDF system are very close to those of FORTH [Moo74], it is implemented at a higher level. It is receiving large funding grants for research.

### 3 Academic Requirements

With the push for more accountability in education academics are increasingly being pushed to produce more refereed papers in both Journals and Conferences [Dav91]. This “Publish or Perish” attitude means that if we are wanting academics to take an interest in FORTH, we are going to have to provide some mechanism for justifying time spent looking into FORTH related issues.

#### 3.1 The Current Situation

At current there are **no** FORTH related conferences. The current so called conferences are all ‘*workshops*’ from the academic viewpoint. The academic (or perhaps more accurately the Research Assessment) definitions are:

**Workshop:** A meeting where practitioners of a technology meet to discuss current issues, projects, research, and advances with the technology. The papers presented at a workshop are current up to date discussion of the technology. Workshops are not normally refereed, with papers being completed (on occasions) on the day of the workshop. For examples of workshops refer to the Springer-Verlag Workshop Series.

**Conference:** A Conference is a meeting of practitioners and researchers to interchange opinions, discuss current issues and research in the technology. The papers at a conference have all be refereed, and are published (in a conference proceedings) before the conference.

#### 3.2 Current Conferences

The following is a list of the current FORTH conferences:

**FORML:** (FORTH Modification Laboratory) By its very title this is a “Laboratory”, or a Workshop. The material presented most defiantly falls into

the Workshop category. This is a meeting of practitioners discussing technical aspects of current projects. Proposed extensions to the technology, etc. The presentations are not refereed and very often opinion, with little or no supporting argument.

**EuroFORML:** (European FORTH Modification Laboratory) This is a European version of the FORML conference, the same comments hold. It is a Workshop with presentations on current projects, technical extensions, and opinions are given.

**EuroFORTH:** (European FORTH conference) For various reasons some vendors involved in EuroFORML, wanted to change its name to be more meaningful, thus the EuroFORTH conference was formed. Unfortunately this is still the EuroFORML at hart, and is really a Workshop.

This move does, however, show promise. It may be possible to convert the EuroFORML workshop into a fully refereed EuroFORTH conference (see section 4.1).

**Rochester Forth Conference:** While this calms to be a conference, it is not. Papers are reviewed before acceptances, however the papers are not truly refereed. The full proceedings are not available for some time after the conference. Rather than a conference this is indeed a Workshop.

As with EuroFORTH this could be converted into a formal conference. Being organised by the Institute of Applied Forth Research (publisher of the only refereed Journal) this should prove to be a very simple operation, involving little additional organisation.

**Forth Language Workshop:** This is a workshop held by the ACM Special Interest Group on FORTH as part of the larger ACM Computer Science Conference (in conjunction with the ACM Computer Science Education Conference, and the ACM Symposium on Applied Computing). It currently enjoys sufficient support that an independent workshop is no envisaged.

### 3.3 Current Journal

Now we look at the current FORTH related publications:

**Journal of Forth Application and Research:** This is a formally refereed Journal, published by the Institute of Applied FORTH Research. The journal carries papers on all aspects of the language. Technical issue of current projects, reports on current research, etc.

This Journal seems to be going through a lethargic stage. I submitted a paper in 1990 and have yet to recieve any form of acknolgment. In

addition to this, the last issue of the Journal to be published was Volume 6, Issue 2, in 1990.

If we are wanting to encourage people to write papers of academic standing this is simply intolerable.

**Soviet Journal of Forth Application and Research:** The, now defunct, soviet version of the Journal of FORTH Application and Research. It carried translations of papers appearing in the Journal, and some original (refereed) papers of its own.

One edition was published, although some additional “electronic editions” were published, this also appears to have come to an end.

**SIG-Forth:** The ACM SIG-FORTH Newsletter, publishes unrefereed articles and letters. Although generally of good quality the material is not refereed.

**Forth Dimensions:** A publication of the FORTH Interest Group. Articles may be reviewed, and edited, but are certainly not refereed. As with the SIG-FORTH Newsletter, the quality of the material is generally good, however, publication in such an organ is of no academic credit.

**Others:** Several other magazines and journals will publish the occasional article on FORTH. Dr. Dobbs Journal, Byte, Embedded Systems Programming, Midnight Engineering, etc. However, these are magazines that take interesting articles. The articles published by such magazines may be of interest, but do not carry any academic credit.

## 4 The Future

These are comments, recommendations, suggestions as to how we may be able to make FORTH more attractive to academics, or at least provide a means of justification for academic interest in FORTH.

### 4.1 Conferences

I feel that the Rochester FORTH Conference should be converted into a true conference. That is to say, an organising committee receiving papers for review. As this conference is currently organised by the Institute for Applied FORTH Research, it should not be too difficult to arrange a full program committee/referees, etc.

The EuroFORML workshop, should be called EuroFORTH. This is less confusing for people outside the community and makes it easier to justify attendance

than the ‘FORTH Modification Laboratory’. I also recommend that the EuroFORML be converted into a full refereed conference. Thus using a new name for a new style of meeting.

It is not my aim to change the style or manner of the meetings, simply to make them more academically acceptable. I suggest the EuroFORML conference be made into a formal conference, complete with conference (program) committee, refereed papers etc. Having said that papers must be refereed and effectively published before appearance at the conference, there is nothing stopping the conference chairman/committee from having an official “Workshop”, “Tutorial”, and/or “Plenary” sessions.

## 4.2 Journals

We should be well served in this department, however, the “Journal of FORTH Application and Research” has not published since 1990. The Journal being published by the Institute for Applied FORTH Research could be seen as somewhat incestuous. For a Journal to be acceptable it should be published by an independent publisher. This would mean that the publisher sees sufficient interest (or sales) to back a Journal. A Journal being published by the community it serves is generally disregarded as a “crack-pot” journal of no academic standing.

Could we start a European FORTH Journal? If possible we should approach a known publisher with this idea rather than taking it on ourselves. Possible suggestions would be Springer-Verlag, John Wiley & Sons, North-Holland, McGraw Hill. . . . Perhaps it may be possible to obtain monies from the EEC to support such an effort?

To start such a Journal an ‘editor in chief’ is required, besides a full set of people prepared to referee papers. Presently I feel that the community can only really support one Journal, however, the current status of the Journal of FORTH Application and Research is sufficiently vague that I feel a new (possibly european) Journal may be required.

## 5 And Beyond. . .

It is envisaged that when FORTH does become more accepted we must dispell the “hackers” myth from the FORTH Interest Group. We propose a new membership based organisation to monitor and control the ‘professional’ FORTH programmers. An outline for such an organisation may be:

- It will be supported by membership subscriptions (and possibly corporate subscriptions).
- It would confer ‘Student’, ‘Associate’, ‘Member’, and ‘Fellow’ status on its members. Thus allowing an employer to gage the standing of a FORTH programmer, by his membership status.

- Would validate taught courses. Possibly leading to direct acceptance at ‘Associate’ or ‘Member’ level.
- May be charged with the organisation of the formal conferences. (Euro-FORTH?)
- May publish a FORTH Journal.

Precisely how such an organisation should operate is another matter. There are currently a few suggestions:

- It should be set up as a totally new organisation. With a name such as the “Institute of FORTH Programmers”. Precisely how the initial capital would be raised is another question.

This has an inherent drawback. The institute will have no academic standing. Indeed it probably would be seen as a new name for the FORTH Interest Group. This we are trying to avoid. It will also duplicating efforts of both the FORTH Interest Group, and the Institute for Applied FORTH Research.

- It should be set up under the guidance of the British Computer Society (BCS).
- It should be set up as a subgroup of the Institute for Electrical Engineers (IEE).

Both suggestions mean a Special Interest Group. Membership to such an organisation may be a requirement before membership of the SIG. Perhaps the ACM SIG could be reformed into this new organisation?

- A Special Interest Group as a joint-subgroup between the BCS and the IEE.

Investigation of this matter has not extended beyond the speculation stage. We now await comment, suggestions, and support on this idea.

## 6 Summary

In this paper we have attempted to look at the problems affecting the general acceptance of FORTH. In particular we have investigated its academic standing. We have taken stock of its current standing, and the perceived current prejudices.

In the current era of accountability (the “publish or perish” temperament) academics can no longer justify being involved in, or even interested in, FORTH. We must provide a basis for such justification. Two main suggestions were put forward:

- We have at least one refereed conference. This will be a redevelopment of an existing ‘workshop’. The Rochester FORTH Conference and the EuroFORTH Conference where suggested.
- We have at least one independent refereed Journal. This will have to fight in the marketplace with the existing FORTH Journals.

As FORTH gains more general acceptance it is seen that we will require some control over the standard of FORTH programmers if we are to remove some old prejudices. The idea of a controlling body was outlined. Precisely how this body is to operate, and under what conditions, is left open to discussion.

All of the material presented is open to correction, question, and suggestions. The intention of this paper is to *provoke discussion* within the community. A full workshop may be required to discuss some of these ideas and to develop some firm proposals.

## References

- [ANS93] American National Standard for Information Systems — Programming Languages — FORTH. American National Standards Institute, Inc., June 1993. Standard X3.215–199x, X3J14 dpANS–6.
- [Bra92] Mitch Bradley. Open boot firmware. In *Proc. of the Winter 1992 USENIX Conf.*, pages 223–35, January 1992.
- [Bro82] Leo Brodie. *Starting FORTH*. Prentice Hall International, second edition, 1982.
- [Bro84] Leo Brodie. *Thinking FORTH*. Prentice Hall International, 1984. Withdrawn from catalog.
- [Bro90] Kent M. Brothers. The FORTH system behind VP-Planner: Designing for efficiency in the face of complexity. In *Proc. Rochester FORTH Conf. on Embedded Systems*, pages 5–12, June 1990.
- [Dav91] Graeme Davies. The 1992 research assessment exercise. Circular Letter 22/91, Universities Funding Council, October 1991.
- [Moo74] Charles H. Moore. FORTH: a new way to program a mini-computer. *Astronomy & Astrophysics Supplement*, 15:497–511, 1974.
- [OSF91] ANDF, application portability, and open systems: A white paper. Technical Report O-ANDF-WP17-1, Open Software Foundation, Stefan-George-Ring 29, 8000 Munich 81, Germany, June 1991.