

# Recommendations of the Council of International Fuzzy Systems Association (IFSA) on fuzzy-related publications

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## 1 Why do we need such recommendations

At several recent fuzzy conferences, Bernard De Baets, Editor in Chief of *Fuzzy Sets and Systems* (one of the main fuzzy-related publications), provided suggestions on how to write good papers, and how to avoid typical mistakes. This was especially important to young researchers who have just started their research career.

Those who attended these talks definitely benefited from this advice. During the discussion, several participants expressed the need to make this advice more widely available, ideally as general recommendation of IFSA for all IFSA-sponsored events.

## 2 Recommendations for authors

We recommend that the papers have the following general structure:

1. A brief description of the general practical problem in which the new idea is helpful or expected to be helpful.
2. A brief overview of the current methods for solving this problem, with a clear explanation of their limitations – namely, limitations that the proposed idea intends to fully or partially overcome.
3. A description of a new idea and an explanation of how this idea helps to overcome the above-described limitations.

## 3 Detailed comments about these recommendations

### 3.1 Comments on Recommendation 1

#### 3.1.1 We want published papers to be clear to as many readers as possible

At present, many submitted and published papers start by saying, e.g., that their goal is to improve VAT techniques. This maybe clear to those who know what are VAT techniques and why they are useful, but to many other readers, it is desirable to explain what exactly practical problem is being solved. Computer science is, after all, an applied discipline, our goal is to help others solve practical problems.

#### 3.1.2 It is OK to have papers solving future practical problems

Practical problems do not have to be today's problems, future problems are OK. For example, at this moment, no existing quantum computers can break the currently used encryptions, but since this is expected in the future, it is definition important to work on encryption methods that will be safe against quantum computations.

### 3.2 Comments on Recommendations 2 and 3

Situations that we want to avoid:

- Some authors do not even bother to google what is already known. So, when a reviewer places the paper title in the google search, immediately several papers not cited by the authors pop up. In some cases, such authors have wasted their effort by reinventing the wheel, in other cases the method may be new, but the paper still cannot be published without first explaining in what sense this method is better.

Some new authors naively think that novelty is enough for publication, but if a new method is worse that what is used now – who needs it?

We want to avoid papers in which there is no comparison and no explanation at all – a new method is proposed, a numerical example is given, but the authors never explain in what sense the new method is better. Without an explanation of why the method is better, the fact that the numerical example is from some application domain does not mean that this method has been applied to this domain – unless it is clearly explained in what sense the new method is better.

- Some authors do compare their new method with what is known now, but they only compare with other fuzzy methods – while there is no attempt to compare with other techniques for solving the same problem.

- Some authors only compare with what many practitioners use, but they also need to compare with what has been proposed in published papers.

Of course, if there is a method that has already proven to be, in some specific sense, better than others, then all the authors need is cite this specific method – and a publication in which it is shown that this method is indeed better.

### **3.3 The comparison does not have to be 100% convincing**

We do not mean that there should necessarily be a formal proof or a statistically convincing comparison, but it is important to have some explanation – formal or informal – of why the author(s) believe that the new method is, in some sense, better, with a clear explanation in what exactly sense this method is better.

Some researchers may be better in generating new ideas, some in implementing them. It would be counter-productive to require that all authors of new ideas provide a rigorous confirmation that these methods work well – that would, e.g., prevent Einstein from publishing his General Relativity paper, since he was a theoretician and did not have needed experimental skills.

Any reasonable criterion is OK: it may be accuracy of the result, it may be computation time, it may be easiness to understand, it may be a better match of results with common sense, etc.

The criterion should be clear: e.g., if the author claims that an image generated by his/her method is better, there should be a numerical value explaining in what sense the image is better.

## **4 Recommendation for journal editors and conference organizers**

We recommend that the journal editors and conference organizers:

- explicitly include the above recommendations for authors in their calls for papers, and
- explicitly include the need to check for these recommendations in their instructions for reviewers, editors of special issues, etc.

## **5 How these recommendations will benefit everyone**

1. These recommendations will help *potential authors*:

- to get published, especially in non-fuzzy publications where the above recommendations are common sense, and
- to avoid wasting time on papers re-inventing the wheel or introducing new methods without any comparison

2. These recommendations will help *reviewers and editors* not waste time processing submissions that are clearly not yet ready for publications.
3. These recommendations will help *supervisors of young researchers* – these researchers will see that what their supervisor tells them in a communal practice and not some personal vicious nitpicking – as some young students think.
4. These recommendations will also help *fuzzy research community* to better avoid negative attitude about fuzzy.

This attitude often appears when these folks read published fuzzy-related papers where all the authors do is provide a new definition or method and a numerical example, without any justification of why the proposed method is better than what was done before.

## **6 Reproducibility: an important publication-related issue**

### **6.1 Reproducibility is a usual requirements for publications**

In general, in the scientific community, the usual practice is to publish all the details, so that others will be able to reproduce the results.

### **6.2 What this requirement tries to avoid**

One of the reasons for this is to avoid papers that are really advertisements for a product that run like this: we have a new method, we will not explain what it does – it is proprietary – but here is how well it behaves. Such publications are appropriate for company journals and technical magazines but not for academic publications.

### **6.3 Sometimes, full reproducibility is not possible, but the authors should aim for as much reproducibility as possible**

However, we should not overdo this requirements – otherwise, we will not be able to publicize a lot of interesting developments performed in industry.

Indeed, many good published papers use commercial software – be it an operating system, Matlab package, or a Large Language Model such as ChatGPT – for which details are proprietary. If the corresponding software is available, so that reviewers and readers can repeat the experiments, this is OK even if details are not provided.

But, it should not be just an advertisement: some idea(s) needs to be described explicitly, even if this description does not come with details.

Same with data on which the method was tested: the corresponding data may have come from real patients and is therefore protected for privacy, but some simulated data can be provided to show that the new method works well.