

Introduction of a Peer-review Process to an Interdisciplinary Symposium on Virtual Vehicle Development

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ABSTRACT

Because of the growing importance of ratings of scientific output such as the Hirsch index, scientists are increasingly obliged to publish peer-reviewed articles. The present paper describes the experiences of the introduction of a peer-reviewing process to an annual conference where people from industry and academia are attending and presenting innovations in the field of virtual vehicle development. This was achieved by a process including peer- and not peer-reviewed articles; and a peer-review process consisting of four stages. These stages were carried out by the editorial board, a separate board of reviewers and the conference chair respectively. Advantages and disadvantages of this process are discussed.

Keywords: Peer-review, double-blind, multi stage review, conference proceedings, citation database, scientific output

1. INTRODUCTION

Advantages and disadvantages of peer-reviewing of scientific publications have been controversially discussed for a long time, e.g. [1-4]. Nevertheless, ratings to quantify the scientific output such as the h-index [5], g-index [6], q²-Index [7] and others are based on articles, which are indexed in citation databases of peer-reviewed literature, e.g. [8, 9]. These ratings are increasingly used for evaluations of scientific output. This makes it more important for scientists to publish peer-reviewed articles. The present paper does not intend to contribute to this discussion, but to describe experiences with the introduction of peer-reviewing to a specific conference.

2. METHODOLOGY

An annual symposium dealing with virtual vehicle development was started in 2008, [10]. The purpose of the symposium is an interdisciplinary exchange of innovations and ideas dealing with the development of the complex products automobiles and railway systems. Additionally, the symposium intends to gather experts from the automotive industry, from software vendors and from the academic research. In the first edition of the

symposium only not peer-reviewed papers based on slide presentations were contributed, [11]. The contributions were selected by the editorial board based on the submitted abstract but without reviewing the final paper itself.

In order to attract authors from all target groups including academia, the call for papers in the second edition of the symposium included firstly *industry-oriented papers* and secondly *scientific papers*, [12]. *Industry-oriented papers* were not reviewed and usually presentations. The corresponding papers provided in the conference proceedings were based on the abstract and presentation slides or a written paper. *Scientific papers* were full papers and underwent a specially tailored review process for the symposium, which will be explained below.

In this first year with peer-reviewing, the editorial board carried out this task. It was seen, that this procedure is not advisable with a higher number of papers submitted for review, since the number of members in the editorial board would not allow three peer-reviews per paper without overloading the involved people. Also the wide spectrum of virtual development in automotive engineering called for a broader board of reviewers with specialised expertise. Additionally, external reviewers could bring in further aspects that are important for the symposium.

Hence, in the third edition of the symposium, the peer-review process was revised. Fig. 1 depicts the scheme of the process which will be discussed in the following. A board of reviewers was established which included well-accepted experts from academia and automotive industry of different expertises and specialisation. An important point to attract those reviewers was the confirmation that only one paper per year was to be reviewed and that the revised version of the papers was not intended to send back to the reviewers.

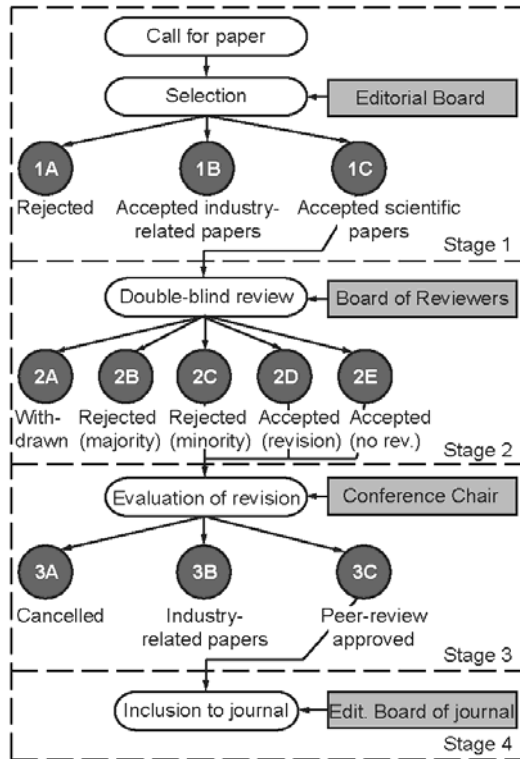


Fig. 1: Scheme of discussed reviewing process

However, all submitted abstracts, *industry-oriented* as well as *scientific* related were approved by the editorial board only, which was the **first stage** of the review process. The submitted papers were grouped according to Table 1.

Table 1: Groups resulting from 1st stage of reviewing

Group	Description	Nr.
Group 1A	Rejected	7
Group 1B	Accepted as industry-oriented paper, no further peer review	14
Group 1C	Accepted as scientific paper, peer-review to be initiated	6

Group 1A were rejected contributions, group 1B accepted industry-oriented papers which needed no further peer-reviewing and group 1C were accepted scientific papers where a peer-review was initiated.

Since the decision for acceptance was based on the abstract, the criteria for decision were limited to the rating how the paper suited to the symposiums' topics, as well as the innovations and the methods described in the abstract. The accepted scientific papers were selected for **double-blind review**, which was **stage two** of the review. The head of the board of reviewers distributed the papers to three members of this board with a specialisation in the respective topic of the paper. Here, the role of this person was important since he evaluated the expertise of reviewers and authors.

The reviewers were provided with a check-list how to rate the quality of the paper. Additionally they were asked to write comments directly into the paper, if appropriate. The check-list contained the criteria listed in Table 2.

Table 2: Criteria for stage 2 of the review

Presentation: How was the paper presentation?	<input type="checkbox"/> Poor <input type="checkbox"/> Just Ok <input type="checkbox"/> Good <input type="checkbox"/> Very Good
Appropriateness: Is the paper appropriate to the topics of the conference?	<input type="checkbox"/> Poor <input type="checkbox"/> Just Ok <input type="checkbox"/> Good <input type="checkbox"/> Very Good
Organization: How do you consider the paper organization and flow of ideas?	<input type="checkbox"/> Poor <input type="checkbox"/> Just OK <input type="checkbox"/> Good <input type="checkbox"/> Very Good
Originality: How do you rate the novelty and originality of this work?	<input type="checkbox"/> No New Contribution <input type="checkbox"/> A Slight modification of concepts <input type="checkbox"/> An Interesting contribution <input type="checkbox"/> A major contribution
Acceptance Score: This paper should be ...	<input type="checkbox"/> Totally Rejected <input type="checkbox"/> Marginally Rejected <input type="checkbox"/> Marginally Accepted <input type="checkbox"/> Totally Accepted
Clarity: Was the paper clear in its remarks, theory and results?	<input type="checkbox"/> Barely Understandable <input type="checkbox"/> Understandable with some vagueness <input type="checkbox"/> Understandable <input type="checkbox"/> Very Clear

Based on the results of the reviewers, the papers were divided into five groups, see Table 3. Group 2A included papers that were withdrawn by the authors. Group 2B included papers, where the majority of the reviewers totally rejected the paper. These papers were not intended for further revision by the authors and also cancelled from the conference program. Group 2C included papers which were partially or totally rejected by the minority of the reviewers. Automatically these papers were accepted as industry-oriented papers but the authors were given the opportunity to proceed with a major paper revision. Group 2D was similar, but all reviewers accepted the paper. Still a major revision was requested in this group to pass the peer-review process. Group 2E included accepted papers with no or minor revisions.

Table 3: Groups resulting from 2nd stage of reviewing

Group ID	Description	Nr.
Group 2A	Withdrawal by author	2
Group 2B	Rejected by majority of reviewers	0
Group 2C	Rejected by minority of reviewers	2
Group 2D	Accepted by majority of reviewers, major revision required	2
Group 2E	Accepted by majority of reviewers, no or minor revision required	0

For distinction of peer-reviewed and not peer-reviewed papers, a "*peer-review approved seal of quality*" was introduced to the conference proceedings. This procedure is comparable to one of the ATZ (Automobiltechnische Zeitschrift), [13]. In order to gain this seal of quality, the reviewer comments had to be taken into account by the author of the respective paper. The revised version was sent back to the head of the reviewer board and also a summary, how the comments were treated, was requested from the authors.

The **third stage** of the review process was carried out by the conference chair consisting of three people. Based on the

revised version of the paper and the summary how the reviewer comments were treated, the chair decided upon acceptance. Table 4 shows the result of the third stage. Group 3A were papers that were withdrawn or rejected, Group 3B were papers which did not pass the peer-review process but were approved for oral presentation as an *industry-oriented paper* and group 3C was the “*peer-review approved*” group of papers.

Table 4: Groups resulting from 3rd stage of reviewing

Group ID	Description	Nr
Group 3A	Cancelled from program (withdrawal or complete rejection by stage 2)	0
Group 3B	Accepted for oral presentation and inclusion into conference proceedings	2
Group 3C	Peer-Review approved	2

The final and **fourth stage** will be the inclusion of selected papers to a journal, preferably indexed in important citation databases, which is not yet defined. Whether another review process by the editorial board of the journal is to be followed or not will depend on the selection of the journal.

4. RESULTS

The initial call for papers attracted 21 authors to submit *industry-related* and 6 authors to submit *scientific papers* for peer-review. 20 papers were accepted by the editorial board, stage 1, of which were 20 industry related and 6 scientific papers. During stage 2 of the peer-review process, two authors withdrew their papers, group 2A. No paper was rejected by the majority of the reviewers, group 2B. Two papers were rejected totally or partially by the minority of the reviewers, group 2C. Further two papers were accepted but a major revision was requested, group 2D. No paper was accepted without modifications, group 2E. Most of the criticism mentioned by the reviewers was related to the depth of the description of methods and approaches. In stage 3, carried out by the conference chair, 2 (50%) of the remaining papers did not achieve the *peer-review seal of quality*, group 3C. Further two papers passed the final acceptance, group 3C. The basis for decision for acceptance was the evaluation how well the reviewer comments were respected. Of course, also the rejection to incorporate a specific comment was accepted when comprehensibly explained. The inclusion of selected papers into a relevant journal, stage 4, is ongoing.

5. DISCUSSION

A symposium that wants to attract authors from industry as well as from academia has to carefully select its contributions. On the one hand, “*industry-oriented*” papers allow authors from vehicle manufacturers, system suppliers or software vendors to present innovations in virtual vehicle development in a fast and efficient way. These contributions were selected by evaluation of the abstract by the editorial board, **stage 1**. On the other hand, contributions of academia are better attracted if they are peer-reviewed and intended for later inclusion into a journal, especially when this journal is indexed by publication databases. The multi-disciplinary expertise needed for vehicle development requests a high number of well-accepted experts. In order to respect the limited time of these experts, it turned out (in this particular case) to be more useful to have their expertise only in one stage of the review process, which was **stage 2** of the described process. Especially it has to be mentioned that only one review per year was requested from those experts. The

final decision of acceptance by the conference chair, **stage 3**, allowed also reflecting the symposium’s intentions.

Nevertheless, in this particular symposium still some issues have to be solved: First of all, the time schedule for submission, revision and final acceptance has to be extended. It is important that authors and reviewers have sufficient time for their tasks. Next, the criteria for acceptance have to be communicated more clearly to the authors. In the third year of the symposium it was seen that there was a difference between authors and reviewers expectations. In this particular conference this was the scientific description of the used methodology. Especially the depth how the methods were described was often criticised by the external reviewers. Handing back the revised papers to the reviewers or a direct peer-to-peer review process which could further improve the quality of the contributions are not considered advisable for this particular conference. The main problem is that the establishment of a review board with well-accepted experts has to be time-efficient for the members; otherwise they would not participate in most cases. The reviewer board in this particular conference consisted of experts in automotive industry in leading positions as well as from university, mostly heads of well-accepted institutes. Therefore, the conference chair decided upon final acceptance. The selection of reviewers was done by the head of the board of reviewers which turned out to be a crucial task for the final goal, an objective rating of scientific papers. The expertise of the head of the board of reviewers has to cover the complete spectrum of the symposium’s topics.

It has to be mentioned that the peer-reviewing was carried out on a comparable small number of papers. This gave the head of the reviewer’s board the chance to select the reviewers with a specialised expertise of the paper. In case of expected increasing numbers of peer-reviewed papers in the next years, this would need to increase the number of reviewers. The final stage 4, the inclusion to a suited journal which is indexed by citation databases is ongoing.

The main source for error in the described reviewing process is the assignment of reviewers to the different papers which was done only by one person, the head of the reviewer’s board, stage 2. A possible solution would be to assign this task to the editorial board to cover a broader spectrum of opinions. Another, however unavoidable source of error is the quality and depth of the reviews carried out. An increase in the number of reviewers could average the consequences of this fact, but bring also the issues of divergent reviews and a longer and more complicated process. A possible compromise that will be tried out will be 5 instead of 3 reviewers. No findings between open and blind reviews could be drawn, because of the comparatively small number of papers and reviewers. Finally the revision how well the reviewer’s comments have been taken into account by the authors (stage 3) is another possible source for error. The selected solution to assign this task to the conference chair turned out to be an efficient alternative, however since only three persons are acting, still a source for errors exists which was considered acceptable.

6. CONCLUSIONS

The present paper reported experiences with the introduction of a peer-review process to an annual conference on virtual vehicle development. The process consisted of four distinct stages. Stage 1, the selection of papers carried out by the editorial board, selected the papers by evaluation of the submitted abstracts. Authors could choose between *industry-oriented contributions* which were not reviewed and *scientific papers*

which were reviewed in a specially tailored process. These papers were evaluated by a separate and external board of reviewers, stage 2. The special characteristic of the described process was the double-blind assignment of three reviewers of, firstly a high-level reputation in the scientific community **and** secondly, with a special expertise in the topic of the paper. The final acceptance, stage 3, was decided by the conference chair, based on evaluation of the final version with respect to the reviewer's comments. The final stage 4 is the ongoing inclusion of the paper in an indexed journal.

The process turned out to be time-efficient but still revealed some issues that will be addressed in the future. The main issues are the assignment of reviewers to the different papers and the number of reviewers per paper. The first issue will be addressed by assigning this task to the editorial board and the second by raising the number of reviewers to five per paper. Consequently the length of the process and the number of the board of reviewers has to be enlarged. One further important experience was to clarify the expectations of the symposium from authors of scientific papers in future.

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