

Decision regarding research misconduct

Decision

The National Board for Assessment of Research Misconduct (“the Board” or “NPOF”) finds [REDACTED] and [REDACTED] guilty of research misconduct.

Background

On 21 December 2022, Luleå University of Technology submitted to the Board a case concerning research misconduct. The submission took place in accordance with Section 6 of the Act (2019:504) on responsibility for good research practice and the examination of research misconduct.

The research relates to electric-power technology and how machine-learning methods can be used to characterise voltage variations across the power grid in various countries.

The submission concerns suspicions of plagiarism relating to the following articles:

- A. Article A — [REDACTED]
[REDACTED] (2022). Seeking patterns in rms voltage variations at the sub-10-minute scale from multiple locations via unsupervised learning and patterns’ post-processing, *International Journal of Electrical Power & Energy Systems* 143, 108516.

The suspicions relate to plagiarism of text from articles C, D and E listed below.

- B. Article B — [REDACTED]
(2022). An unsupervised learning schema for seeking patterns in rms voltage variations at the sub-10-minute time scale, *Sustainable Energy, Grids and Networks* 31, 100773.

The suspicions concern plagiarism of text from Articles C, D and E listed below.

The authors whose names are underlined carried out the research at a Swedish entity responsible for research. The other authors conducted their research abroad.

According to the submission, the suspected plagiarism took place from the following source articles:

Article C — [REDACTED] (2020). Characterization methods and typical levels of variations in rms voltage at the time scale between 1 second and 10 minutes. *Electric Power Systems Research* 184, 106322.

Article D — [REDACTED] (2020). Deep feature clustering for seeking patterns in daily harmonic variations. *IEEE Transactions on Instrumentation and Measurement* 70, 1–10.

Article E — [REDACTED] (2021). Unsupervised deep learning and analysis of harmonic variation patterns using big data from multiple locations. *Electric Power Systems Research* 194, 107042.

[REDACTED] statement

[REDACTED] contests the allegation that he is guilty of plagiarism. He argues that the parts of the articles that have the most overlap with the sources, Articles C, D and E — parts of the introduction and part of the method description called “Clustering using k-means” (Article A) or “K-means clustering” (Article B) — are parts that were mainly the responsibility of [REDACTED]. [REDACTED] states that he and his co-authors should have checked these parts more carefully, but that they trusted [REDACTED]. He emphasises that the overlap with the earlier articles is only a few per cent in total and that the journals in which the articles were published judged that there was insufficient overlap to constitute plagiarism.

[REDACTED] statement

[REDACTED] contests the allegation that he is guilty of plagiarism. However, he thinks the accusations of plagiarism are well founded and also states that the method and data are plagiarised, without due recognition given to the source articles. He declares that, except for minor corrections and wording revisions, he neither directly contributed any text to the articles nor read the final versions before they were sent for publication. He states that he was therefore unaware of the large textual overlap or the shortcomings in the source referencing. These became apparent to him only after the articles had been published, when this was pointed out to him by another person.

He declares that he was aware that the method and data had been published in earlier articles, and considers that this is an acceptable approach if it is the first time the method has been applied to the data presented. He believes that it becomes unethical only when due recognition is not given to the original sources, which he believes is the case with respect to Articles A and B. After becoming aware of what he regards as the existing flaws in the articles, he tried to get the articles retracted, but according to his statement, [REDACTED] worked against this.

Legal regulation

Under the Swedish Act (2019:504) on responsibility for good research practice and the examination of research misconduct (“the Act”), the Board is tasked to investigate issues of research misconduct.

Section 2 of the Act defines research misconduct as a serious breach of good research practice in the form of fabrication, falsification or plagiarism, committed with intent or through gross negligence, in the planning, conduct or reporting of research.

The Board's investigation takes place in stages with the above provision as the starting point.

Grounds for decision

Research covered

Under Section 3, the Act covers research conducted by higher education institutions that have the Swedish state as the entity responsible for their research and are subject to the Swedish Higher Education Act (1992:1434), and also by other government agencies, municipalities and regions and certain other specified activities.

██████████ and ██████████ were employees at Luleå University of Technology when the work on Articles A and B was being carried out. Research at Luleå University of Technology is covered by the Act and their research is thus subject to the Board's investigation. ██████████ and ██████████ carried out the research at universities abroad and are therefore not covered by the Board's review.

Planning, conduct or reporting of research

According to the definition in Section 2 of the Act, breaches of good research practice that may constitute research misconduct must have been committed during the planning, conduct or reporting of research. This means that the concept of "misconduct" refers to breaches throughout the research process.¹ "Reporting" refers to both publishing and other types of disclosure.²

The Board considers that Articles A and B constitute "reporting of research" since they are published in scientific journals.

Fabrication, falsification or plagiarism

The Board's remit is to investigate three forms of research misconduct: fabrication, falsification and plagiarism. These terms are not defined by law, but the preparatory work for the Act refers to the fact that they are described in codes

¹ Government Bill 2018/19:58, p. 100.

² Government Bill 2018/19:58, p. 49.

(codices) and guidelines on research ethics, such as *The European Code of Conduct for Research Integrity*.^{3,4}

Fabrication means that the researcher invents results, and documents them as if they were genuine.

Falsification refers to manipulation of research material, equipment or processes, or unjustified alteration, omission or suppression of data or results.

Plagiarism means that a researcher uses other people's texts, ideas or work without duly acknowledging the original source.⁵

The submission from Luleå University of Technology concerns plagiarism of text in Articles A and B from Articles C, D and E.

The respondents contest the allegation that they are guilty of plagiarism. [REDACTED] considers that [REDACTED] was responsible for the plagiarised paragraphs and that he approved the text of Articles A and B. [REDACTED] states that he did not write any text for the articles but only contributed comments, and that he did not read the final drafts before publication. He was therefore unaware that the overlap between the articles was so large. He points out that he thinks the main problem is that the source articles were not given due recognition.

The Board has separately compared Articles A and B with C, D and E, using tools including those used for text comparison. The Board considers that in both A and B there is significant overlap with the earlier articles. In Article A, in particular, there is a paragraph in the introduction that largely (close to 90 per cent) corresponds to what is in Article C. Parts of the method description (2.3 and 2.4) overlap with Article D, but here one sentence is especially similar. Altogether in Article A, there are 22 text fragments or sentences where the text corresponds between 50 and 95 per cent with text in the three source articles when insignificant similarities are discounted. Article B contains parts of the introductory sections of Articles C, D and E, where the correspondence is 80–90 per cent. Here, too, parts of the method section are the same as in Article D. In total, there are 31 text passages or sentences in Article B that correspond between 50 and 100 per cent with Articles C, D and E.

The Board considers that significant parts of Articles C, D and E are plagiarised in articles A and B. [REDACTED] is not a co-author of Article C, D or E and has therefore committed plagiarism. [REDACTED] is a co-author of all the articles (A–E) and is thus, in Articles A and B, guilty of plagiarising the other authors of Articles C, D and E.

³ *The European Code of Conduct for Research Integrity*, revised edition. Berlin: All European Academies (ALLEA); 2018, section 3.1.

⁴ Government Bill 2018/19:58, pp. 45, 100.

⁵ Government Bill 2018/19:58, pp. 45, 100.

Serious breach of good research practice

Only serious breaches of good research practice can constitute research misconduct.

In principle, fabrication and falsification are always serious breaches of good research practice.

In certain cases, for example if it is a minor infraction on a single occasion, plagiarism should not be considered a serious breach of good research practice.⁶

In the Board's view, it is in the introduction that the authors construct the presentation of the research reported in the article, and expecting originality in this section is therefore particularly justified. The Board also finds the plagiarism in the introduction to Articles A and B extensive and, accordingly, states it must be regarded as serious.

The plagiarised parts in the method sections of Articles A and B describe a well-established statistical method. They reproduce a couple of equations and there are a limited number of ways to express oneself if they are used to compose a coherent text passage. A certain overlap is therefore to be expected. The plagiarism in the method sections is thus not deemed serious in any of the articles.

Intent or gross negligence

Since 1 January 2020, researchers' responsibility to follow good research practice in their research has been subject to statutory regulation under Section 4 of the Act. The extent of such liability must be examined and assessed on a case-by-case basis.

According to Section 2, the serious deviation from good research practice must have been committed intentionally or through gross negligence to constitute research misconduct.

"Intent" means that the researcher must have understood what (s)he did, while "negligence" means that the researcher, in any case, should have understood this.

"Gross negligence" requires the conduct to stand out as particularly serious or reprehensible. According to the preparatory work for the Act, oversights, carelessness or misunderstanding should not, as a rule, be regarded as gross negligence.⁷

Each respondent claims that it was the other's responsibility to avoid plagiarism in the articles. [REDACTED] refers to his trust in [REDACTED]. [REDACTED] claims

⁶ Government Bill 2018/19:58, p. 100.

⁷ Government Bill 2018/19:58, pp. 50–51, 100.

that he did not contribute text and that he did not have time to read through the articles before they were submitted for publication either.

Since 1 January 2020, researchers' responsibility to follow good research practice in their research has been subject to statutory regulation under Section 4. How far-reaching such liability can or must be is examined and assessed on a case-by-case basis. According to international guidelines,^{8,9} every party in a collaboration must take responsibility for the integrity of the research and, unless otherwise stated, every author has full responsibility for the content of the publication. The article does not specify any division of responsibilities for different sections of the text.

The Board has seen no reason to deviate from the guidelines in the current case and considers that all authors bear responsibility for ensuring that their research follows good research practice. Regardless of who wrote the plagiarised text in the articles, it was the responsibility of both respondents to ensure that plagiarism did not occur. Neither [REDACTED] nor [REDACTED] has fulfilled his responsibilities in this regard, which the Board considers to be grossly negligent with respect to both Article A and Article B.

Summary of the decision

In summary, the Board finds [REDACTED] and [REDACTED] guilty of research misconduct.

The Board considers that there may have been other breaches of good research practice in the research project concerned. These include self-plagiarism and attempts to retract articles without communication with the other authors. The Board submits these suspicions to Luleå University of Technology, which under Chapter 1, Section 17 of the Swedish Higher Education Ordinance (1993:100) has the task of examining breaches of good research practice other than research misconduct.

The Board has made a decision on this matter following a presentation by case officer Sofia Bergström.

Thomas Bull
Chair

Sofia Bergström
Case officer

⁸ *The European Code of Conduct for Research Integrity*, revised edition. Berlin: All European Academies (ALLEA); 2018, section 2.6.

⁹ *Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals*. Updated May 2022, International Committee of Medical Journal Editors. <http://www.icmje.org/recommendations>.