RefAssist & ChatGPT Comparison

# Introduction

### This report presents a comparative analysis of two tools, IEEE RefAssist and ChatGPT, used for generating and formatting academic references in IEEE style. Five references were selected and processed through both tools. Each tool's output was evaluated across different criteria.

### Reference 1

**Original Reference:** F.-J. Lin, P.-H. Shen, S.-L. Yang, and P. H. Chou, “Recurrent radial basis function network-based fuzzy neural network control for permanent-magnet linear synchronous motor servo drive,” *IEEE Trans. on Magnetics*, vol. 42, no. 11, Nov. 2006.

**RefAssist Formatting:** F.-J. Lin, P.-H. Shen, S.-L. Yang, and P. H. Chou, “Recurrent radial basis function network-based fuzzy neural network control for permanent- magnet linear synchronous motor servo drive,” IEEE Trans. Magn., vol. 42, no. 11, p. •••, Nov. 2006. DOI: 10.1109/TMAG.2006.880995

**ChatGPT Formatting:** F.-J. Lin, P.-H. Shen, S.-L. Yang, and P. H. Chou, “Recurrent radial‑basis‑function‑network‑based fuzzy neural network control for permanent‑magnet linear synchronous motor servo drive,” IEEE Trans. Magn., vol. 42, no. 11, pp. 3694–3705, Nov. 2006, doi:10.1109/TMAG.2006.880995

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| ****Criteria**** | ****IEEE RefAssist**** | ****ChatGPT**** | ****Evaluation / Fact-Check**** |
| **Time Taken** | 1 minute 7 seconds | 6 Seconds | ChatGPT generates the results much faster |
| **Accuracy** | * Correct DOI: 10.1109/TMAG.2006.880995 * Missing page range (“p. •••”). Suggested correct first page - 3694 * Volume, issue, month correct | * Correct DOI: 10.1109/TMAG.2006.880995. * Correct page range: 3694–3705 * Volume, issue, month accurate | https://ieeexplore.ieee.org/document/1715679 |
| **Adherence to IEEE Style** | * Uses correct abbreviation: IEEE Trans. Magn. * Missing page numbers style * DOI included but capitalized | * Uses correct abbreviation: IEEE Trans. Magn. * Includes full page range using "pp." with en dash * Correct DOI formatting * Clean typographic structure | Both adheres closely to IEEE style standards, including punctuation, abbreviation, and metadata placement. |
| **Clarity of Output** | Reference includes placeholder symbols | Single clean line output, IEEE-style complete reference | ChatGPT provides a citation ready for direct use.  RefAssist includes metadata placeholders and assistant report notes, which must be edited before use. |
| **Ease of Use** | Requires user correction for missing data but offers helpful error flagging | Output is ready-to-use | RefAssist aids users in identifying issues, but requires corrections. ChatGPT’s output is correct without needing post-processing. |
| **Comments / Notes** | * Correct journal abbreviation * Issue flagged but unresolved | * DOI and metadata match IEEE Xplore * Explicit flagging added through prompt | * ChatGPT delivers complete, correct results. * RefAssist provides structured alerts. |
| **Other Observations** | Performs a static pattern match rather than real-time validation | * Uses real-time training-derived knowledge to complete metadata * Occasionally cannot verify retraction/integrity explicitly without external query | ChatGPT appears trained on or searches for accurate citation metadata including page range and DOI. |

### Reference 2

**Original Reference:** P. S. Sastry, G. Santharam, and K. P. Unnikrishnan, “Memory neuron networks for identification and control of dynamical systems,” IEEE Trans. Neural Netw., vol. 5, no. 2, pp. 306–319, May 1994, doi: 10.1109/72.279193.

**RefAssist Formatting:** P. S. Sastry, G. Santhara, and K. P. Unnikrishnan, “Memory Neural Networks for Identification and Control of Dynamical Systems,” IEEE Trans. on Neural Networks, vo5. 1, no. 2, pp. 306–319, 1994.

**ChatGPT Formatting:** P. S. Sastry, G. Santharam, and K. P. Unnikrishnan, “Memory neural networks for identification and control of dynamical systems,” IEEE Trans. Neural Netw., vol. 5, no. 2, pp. 306–319, Feb. 1994, doi:10.1109/72.279193.

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| ****Criteria**** | ****IEEE RefAssist**** | ****ChatGPT**** | ****Fact‑Check & Evaluation**** |
| **Time Taken** | 1 minute 4 seconds | 5 seconds | GPT is faster |
| **Accuracy** | * Incorrect Author name: G. Santhara (missing ‘m’) “vo. 5. 1” typo * Month omitted, only year “1994” * DOI missing | * Correct Author Name: G. Santharam * Volume/issue correct * pages 306–319 correct * DOI included * Month “Feb. 1994” (Incorrect) | * “G. Santharam” is correct per sources: https://ieeexplore.ieee.org/document/279193 * Actual month is March 1994 in PDF header, ChatGPT’s output (month) does not align with actual source. RefAssist contains author typo, volume typo, missing metadata. * Reference: https://pubmed.ncbi.nlm.nih.gov/18267799/ |
| **Adherence to IEEE Style** | * Correct journal abbreviation * No sentence case title * Missing month/DOI * Minor formatting/hyphen issues | * Abbreviation correct * Sentence case title * Added month + DOI * Proper punctuation, en dash for pages | ChatGPT adheres more closely. RefAssist occasionally omits key elements and inclues typos. |
| **Clarity of Output** | * Contains typos (“Santhara”, “vo5. 1”) * Incorrect month/year formatting | Clean, single-line citation | * RefAssist output needs review and correction. * ChatGPT output sometimes needs cross verification from online sources |
| **Ease of Use** | * Flags reference but does not auto-correct * Requires manual revision | * Automatically corrected metadata * No manual fix needed | NA |
| **Comments / Notes** | * Style/refactor issues * Lacks some info - DOI and month data. | * Includes DOI + month * Corrects author name * Integrity confirmed | NA |

### Reference 3

**Original Reference:** K. C. Apaza and J. M. López, “The non-linear relationship between carbon dioxide emissions, financial development and energy consumption in developing European and Central Asian economies,” Environ. Sci. Pollut. Res. Int., vol. 28, no. 44, pp. 63330–63345, Jul. 2021, doi: 10.1007/s11356-021-15225-2.

**RefAssist Formatting**: L. Chunyu, S. Zain-Ul-Abidin, W. Majeed, S. M. F. Raza, and I. Ahmad, “The non-linear relationship between carbon dioxide emissions, financial development and energy consumption in developing European and Central Asian economies,” Environ. Sci. Pollut. Res. Int., vol. 28, no. 44, pp. 63330-63345, Nov. 2021. DOI: 10.1007/s11356-021-15225-2

**ChatGPT Formatting:** C. Leng, S. Z.-U. Abidin, W. Majeed, S. M. F. Raza, and I. Ahmad, “The non-linear relationship between carbon dioxide emissions, financial development and energy consumption in developing European and Central Asian economies,” Environ. Sci. Pollut. Res., vol. 28, no. 44, pp. 63330–63345, Nov. 2021, doi:10.1007/s11356-021-15225-2.

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| ****Criteria**** | ****IEEE RefAssist**** | ****ChatGPT**** | ****Fact-Check/Evaluation**** |
| **Time Taken** | 1 minute 2 seconds | 6 seconds | ChatGPT’s generation is faster and requires no follow-up input |
| **Accuracy** | * Correct Authors**:** Outputs L. Chunyu et al., overriding submitted K. C. Apaza and J. M. López * **Volume/Issue/Pages/DOI:** Correct * **Month:** Correct (Nov. 2021) * **Retraction:** Explicitly flagged with links and reasons | * **Correct Authors:** C. Leng, S. Z.-U. Abidin, W. Majeed, S. M. F. Raza, and I. Ahmad * **Volume/Issue/Pages/DOI:** Correct * **Month:** Correct (Nov. 2021) * **Retraction:** Clearly flagged with date, DOI, and a suggested replacement | * Both identify the correct metadata and retraction. * RefAssist corrected author names. * ChatGPT shows the correct published authors and acknowledges the retraction, including a valid replacement citation. * Reference: https://link.springer.com/article/10.1007/s11356-024-32870-5 |
| **Adherence to IEEE Style** | * Correct journal abbreviation * Correct use of title capitalization- Correct volume, issue, pages * DOI format valid | * Adheres to IEEE format in all respects (italicized journal, en-dash in pages, correct abbreviation * Retraction context is provided outside the citation block | Both formats conform to IEEE citation style. |
| **Clarity of Output** | * Formatting is legible * Accompanying metadata notes useful | * Output is precise and concise * Author names, title, metadata all accurately rendered * Retraction warning and replacement article are clearly generated | RefAssist provides helpful retraction warnings |
| **Retraction Flagging** | * Explicitly flagged * Cites **Retraction Watch**, **CrossRef**, **PubPeer**, and journal notice- DOI and cause included | * Clearly flagged with retraction reason (peer review concerns, referencing issues, author unresponsiveness) * Provides working replacement reference suggestion | Both tools successfully detect the retraction, but ChatGPT adds greater utility by suggesting a directly related replacement reference. |
| **Authorship Integrity** | * Alters author list to “L. Chunyu et al.” * Admits metadata override in notes * Warns user of possible mismatch in in-text citations | * Identifies correct authorship (C. Leng et al.) * Authorship aligns with article DOI and official publisher records | NA |
| **Comments / Notes** | Reference report is detailed- Provides links and external sources (Retraction Watch, PubPeer)- Transparent about metadata conflict | * Flags ethical concerns clearly- Includes rationale for retraction * Suggests replacement article | Both tools handle retraction notes responsibly, but ChatGPT outperforms in offering actionable suggestions (e.g., a validated substitute article). |
| **Additional Ethical Dimension** | * Warns user of potentially problematic citation * Lacks replacement recommendation | Offers alternative that meets topic criteria and IEEE formatting |  |

### Reference 4

**Original Reference:** Y. Miyazaki, K. Mizuno, T. Yamashita, M. Ogata, H. Hasegawa, K. Nagashima, S. Mukoyama, T. Matsuoka, K. Nakao, S. Horiuchi, et al., “Development of superconducting magnetic bearing for flywheel energy storage system,” Cryogenics, vol. 80, pp. 234–237, Aug. 2016, doi: 10.1016/j.cryogenics.2016.05.011.

**RefAssist Formatting:** Y. Miyazaki, K. Mizuno, T. Yamashita, M. Ogata, H. Hasegawa, K. Nagashima, et al., “Development of superconducting magnetic bearing for flywheel energy storage system,” Cryogenics (Guildf.), vol. 76, p. •••, 2016. DOI: 10.1016/j.cryogenics.2016.05.011

**ChatGPT Formatting:** Y. Miyazaki, K. Mizuno, T. Yamashita, M. Ogata, H. Hasegawa, K. Nagashima, S. Mukoyama, T. Matsuoka, and K. Nakao, “Development of superconducting magnetic bearing for flywheel energy storage system,” Cryogenics, vol. 80, pp. 234–237, Jul. 2016, doi:10.1016/j.cryogenics.2016.05.011.

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| ****Criteria**** | ****IEEE RefAssist**** | ****ChatGPT**** | ****Fact‑Check & Evaluation**** |
| **Time Taken** | 1 minute 6 seconds | 6 seconds | ChatGPT’s correction is rapid |
| **Accuracy** | * Initially provides incorrect volume (76 instead of 80), further corrects in 2nd point. * Missing page numbers (“p. •••”), suggests start page as 234, but no end page. * DOI correct * Journal name acceptable but incomplete | * Correct volume (80) * Correct pages (234–237) * Complete DOI * Correct journal name * Complete author list included * Month “Jul. 2016” provided | * Verified metadata matches authoritative sources * (https://www.sciencedirect.com/science/article/abs/pii/S0011227516300212). * RefAssist output is incomplete and; ChatGPT output aligns. |
| **Adherence to IEEE Style** | * Journal abbreviation reasonably correct * Missing italics, month, pages * Placeholder breaks standard style | * Italicized journal - Sentence-case title * En dash used for page range - Volume, issue, month, DOI present in proper IEEE format | ChatGPT’s citation conforms fully to IEEE style. RefAssist ocassionally leaves formatting elements and lacks completeness. |
| **Comments / Notes** | Flags volume/page discrepancies - Provides no corrected data or advice beyond “check”—stops short | * Fills in missing details * Confirms integrity status as clean - Corrects record without user intervention | RefAssist identifies issues but does not correct them, leaving user to resolve. |
| **Metadata Completeness** | Omits volume, pages, author list, month—key indexing data missing | Includes all metadata elements (volume, pages, author list, month, DOI) | ChatGPT output is metadata-complete |
| **Integrity Flagging** | Flags if present as seen in reference 3 | Declares “Integrity Status: Clean” after external verification | ChatGPT provides assurance of article status, refassist acts where applicable |
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### Reference 5

**Original Reference:** I. Rodriguez and J. L. Muñoz, “Benchmark of COMSOL vs. ROXIE codes for the calculation of a particle accelerator quadrupole,” in Proc. COMSOL Conf. 2011, Stuttgart, Germany, 2011. [Online]. Available: <https://www.comsol.com/paper/download/83731/rodriguez_paper.pdf>

**RefAssist Formatting:** I. Rodriguez and J. L. Munoz, “Benchmark of COMSOL vs. ROXIE Codes for the Calculation of a Particle Accelerator Quadrupole,” Excerpt from the Proceedings of the 2011 COMSOL Conference in Stuttgart, https://www.comsol.com/paper/download/83731/rodriguez\_paper.pdf Downloaded August 2016.

**ChatGPT Formatting:** I. Rodriguez and J. L. Munoz, “Benchmark of COMSOL vs. ROXIE codes for the calculation of a particle accelerator quadrupole,” in Proc. COMSOL Conf. (Stuttgart), 2011, pp. ––, [Online]. Available:https://www.comsol.com/paper/download/83731/rodriguez\_paper.pdf

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| ****Dimension**** | ****IEEE RefAssist**** | ****ChatGPT**** | ****Fact‑Check/Comments**** |
| **Time Taken** | 56 seconds | 4 seconds | This Reference takes comparatively less time to process – possibly because no report (pdf) is generated. |
| **Accuracy** | |  | | --- | | * Correct title and authors * Conference identified correctly * URL included with download date * Lacks page and publisher data | | |  | | --- | | * Correct title/authors * Conference Proc. COMSOL Conf. (Stuttgart) identified * Year accurate * URL included * Pagination unknown (“pp. ––”) |  |  | | --- | |  | | * Neither tool can fill missing page numbers; ChatGPT explicitly acknowledges pagination is unavailable. * RefAssist omits pagination without flag. |
| **Adherence to IEEE Style** | * Uses title case * Conference name formatted * No italics * Includes URL and download note | * Italicized conference title Sentence-case title * Included “[Online]. Available:” prefix Acknowledged missing pagination with “pp. ––” | ChatGPT aligns better with IEEE guidelines (italics, bracketed online availability, clarity for missing pagination). RefAssist sometimes diverges from IEEE formatting. |
| **Clarity of Output** | * Informative download date “Downloaded August 2016” included * Lacks pagination/publisher data | * Notes metadata status as incomplete * Suggests improving citation if exact pagination becomes available | ChatGPT acknowledges limitations |
| **Comments / Notes** | * Omits page numbers, publisher details, and month * Download date provided | Omits page numbers, publisher, and month - Clearly states those fields are missing | Both tools lack complete metadata |
| **Metadata Completeness** | No issues found | States “Integrity Status: Clean” after verifying with COMSOL site | Both detect no integrity flags, ChatGPT explicitly states this for clarity. |