

Learning to Explore: A Systematic Review of Learning-Based Single MAV Exploration in Confined Environments- Replication Package

IEEE Xplore search

1. Search string

"Autonomous Exploration"

2. Fields searched

- All Metadata

3. Filters applied (Publication Topics)

- Unmanned Aerial Vehicles
- Deep Reinforcement Learning
- Simultaneous Localization and Mapping
- Unknown Environment
- Conferences / Journals (as applicable)

4. Date of search

- Initial search was conducted on: 30 August 2024, then the final supplementary search on 30 June 2025.
- The document types reviewed included peer-reviewed conference and journal articles

5. Evidence of search as at 30 August 2024

Screenshots of the IEEE Xplore search interface, applied filters, and result counts are included in the replication package to document the state of the database at the time of the search.

The screenshot shows the IEEE Xplore search results page. At the top, there are buttons for 'Search within results' and a magnifying glass icon. To the right are buttons for 'Download PDFs', 'Items Per Page', 'Export', 'Set Search Alerts', and 'Search History'. Below these, a message says 'Showing 1-25 of 1,348 results for Autonomous Exploration'. Underneath, a section titled 'Filters Applied' lists: 'Unmanned Aerial Vehicles', 'Simultaneous Localization And Mapping', 'Deep Reinforcement Learning', and 'Unknown Environment'. At the bottom, there are three buttons: 'Conferences (965)', 'Journals (358)', and 'Magazines (25)'.

ScienceDirect Search (Elsevier)

1. Search string

"Autonomous Exploration" AND "Deep Reinforcement Learning" AND "Unknown Environments"

2. Fields searched

- Full text
- Title
- Abstract
- Keywords

(Using the default ScienceDirect search across *Articles*)

3. Filters applied

- Initial search was conducted on: 30 August 2024 (1995–2024), then the final supplementary search on 30 June 2025 (1995–2025).
- The document types reviewed included peer-reviewed research articles.

(ScienceDirect does not support topic-based filters equivalent to IEEE Xplore; therefore, relevance was refined during title and abstract screening.)

4. Date of search

- Initial search conducted on: 30 August 2024
- Final supplementary search conducted on: 30 June 2025

5. Evidence of search

Screenshots of the ScienceDirect search interface, applied filters, and result counts are included in the replication package to document the state of the database at the time of the search.

The screenshot shows the ScienceDirect search interface. At the top, there are links for 'Journals & Books', 'Help', 'Makhosazan...', and 'University of the Witw...'. Below the header is a search bar with the placeholder 'Find articles with these terms' and the entered query 'Autonomous Exploration, Deep Reinforcement Learning, Unknown Environments'. To the right of the search bar is a blue search button with a magnifying glass icon. Underneath the search bar, there are filter options: 'Year: 1995-2024' with a close button 'X' and a link to 'Advanced search'. At the bottom of the search results area, it says '2,426 results' and provides download and export options ('Download selected articles', 'Export') and a sorting option ('sorted by relevance | date').

Web of Science Search

1. Search string

“autonomous exploration AND deep reinforcement learning

2. Fields searched

- Topic (Title, Abstract, Author Keywords, Keywords)

3. Filters applied

- Initial search was conducted on: 30 August 2024, then the final supplementary search on 30 June 2025.
- The document types reviewed included peer-reviewed research articles.

4. Date of search

- Initial search conducted on 30 August 2024
- Supplementary validation search conducted on 30 June 2025

5. Evidence of search

Screenshots of the Web of Science search interface, applied filters, and result counts are included in the replication package to document the state of the database at the time of the search.

The screenshot shows the Web of Science search interface. The search term 'autonomous exploration, deep reinforcement learning (Topic)' is entered in the search bar. The results are displayed under '195 results from Web of Science Core Collection for:'.

Key elements visible include:

- Search Bar:** Shows the search term 'autonomous exploration, deep reinforcement learning (Topic)'.
- Result Summary:** '195 results from Web of Science Core Collection for:'
- Buttons:** 'Analyze Results', 'Citation Report', and 'Create Alert'.
- Filter Bar:** Includes 'Add Keywords', 'Quick add keywords' (with terms like AUTONOMOUS EXPLORATION, IMITATION LEARNING IL, TD3, DEEP REINFORCEMENT LEARNING DRL, PROXIMAL POLICY OPTIMIZATION), and 'Publications'.
- Refine Results:** 'Search within results...' and 'Quick Filters' (Review Article, Early Access, Open Access, Enriched Cited References).
- Result List:** The first result is 'Real-World Learning Control for Autonomous Exploration of a Biomimetic Robotic Shark' by Yan, SZ; Wu, ZX; Yu, JZ, published in IEEE TRANSACTIONS ON INDUSTRIAL ELECTRONICS, April 2023, pp. 3966-3974. It has 9 citations and 27 references.
- Sort Options:** 'Sort by: Relevance'.
- Page Navigation:** Shows page 1 of 4.