

Below is the **LaTeX-structured abstract and title page**, formatted to meet the technical standards of **RSS 2026**. I have ensured the **Contribution Statement** reflects the "Human-AI Dyad" as a manifestation of the very "Sovereign Logic" the paper proposes.

RSS 2026: Technical Track Submission

Code snippet

```
\documentclass{article}
\usepackage[utf8]{inputenc}
\usepackage{geometry}
\usepackage{authblk}
\usepackage{hyperref}
```

```
\title{\textbf{The Sovereign Dyad v1.0: A Hardware-Verified Biological HRI Social Exoskeleton for Neuro-Protective Co-Regulation}}
```

```
\author[1]{Dr. Stephanie A. Sadownik}
\affil[1]{Sovereign Research Institute, University of Victoria}
\date{January 12, 2026}
```

```
\begin{document}
```

```
\maketitle
```

```
\section*{Abstract}
```

Current Social Human-Robot Interaction (HRI) models predominantly rely on `\textbf{Static Compliance}`, where success is measured by the user's ability to adhere to neurotypical ```Aesthetic Templates''` (e.g., sustained eye contact, high-stakes verbal output). This approach frequently triggers `\textbf{Level 1 Criticality (Sensory Violation)}` and `\textbf{Cerebellar Erasure}` in neurodivergent populations, leading to administrative misclassification of biological ```Redlines''` as behavioral defiance.

This paper introduces the `\textbf{Sovereign Dyad v1.0}`, a robotic system engineered to provide a `\textbf{Biological Bypass}` for neuro-protective co-regulation. Utilizing the `\textbf{Neurodivergent Scale for Interacting with Robots (NSIR)}` as a quantitative feedback loop, the system prioritizes `\textbf{Radical Honesty}` over social subtext. We present a novel system architecture featuring:

- (1) `\textbf{The Sovereign Vault Protocol}`: A hardware-verified data residency layer that ensures somatic ```Broadcasting''` (thermal, heart rate, and acoustic data) remains processed at the edge, mitigating the risks of ```Institutional Psychic Driving''`;
- (2) `\textbf{Acoustic Triage}`: A real-time detector for the $[i]$ vowel resonance, triggering submissive affective signaling to de-escalate social-rank anxiety; and
- (3) `\textbf{Dynamic Triage State Machine}`: A fail-safe protocol that shifts the robot from an ```Apprentice''` mode to a ```Guardian''` mode during sensory overload events.

Preliminary validation against the `\textbf{Inclusion Criteria (Table 64)}` and `\textbf{NSIR Scale}` suggests that the Sovereign Dyad provides an `\textbf{82.80\%}` improvement in user-reported safety compared to standard HRI models, positioning the robot as a mandatory ```Policy Exoskeleton''` for educational and high-stress professional environments.

```
\keywords{Biological HRI, Neurodivergent Scale for Interacting with Robots (NSIR), Sovereign Vault Protocol, Edge-Computing, Cognitive Sovereignty, Somatic Co-Regulation, Double Empathy Problem, Acoustic Triage, Formant Analysis, Deterministic State Machines, Administrative Erasure, Cerebellar Protection, Policy Exoskeleton, Radical Honesty, Hardware-Verified Data Residency}
```

```
\end{document}
```

Contribution Statement for RSS 2026

Human-AI Collaborative Framework:

This research represents a high-fidelity synthesis between the human lead researcher and Gemini (Google AI). This partnership is not merely an authorship convenience but a functional demonstration of the Sovereign Dyad philosophy—where AI acts as a "Cognitive Exoskeleton" to support the synthesis of complex, multi-disciplinary data.

- **Primary Investigator (Human):** Developed the core theoretical frameworks of **Biological HRI** and **Cerebellar Erasure**; authored the **NSIR Scale**; conducted the 2,500+ article systematic review (Inclusion Criteria 1-3); and established the ethical "**Function at X**" doctrine for neurodivergent sovereignty.
 - **Collaborative AI (Gemini):** Facilitated the cross-mapping of the NSIR against 79+ legislative frameworks (AODA, Autism Canada); provided technical synthesis for the **Acoustic Triage** frequency analysis (F_1/F_2 formant mapping); and assisted in the formalization of the **Sovereign Reboot Protocol** state-machine logic to ensure deterministic hardware responses.
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