Artificial Intelligence: Procedural Content Generation

Wits MIND Postdoctoral Fellowship Framework

Host(s)	• Dr Branden Ingram, School of Computer Science and Applied Mathematics. • Dr Oluwarotimi Randle, School of Arts, University of the Witwatersrand.
Funding	• The fellowship provides R350,000 per annum (tax-free) for a fixed, consecutive two-year period. • The fellowship is administered by the MIND Institute, funded by the University of the Witwatersrand Research Council. • The fellowship is based in Johannesburg and is conducted in person on the University of the Witwatersrand campus. • Subject to standard University rules and requirements, as well as research achievements.
Eligibility	• PhD awarded within the past five (5) years. • Must be 35 years or younger. • May not hold full-time salaried employment during the tenure of the fellowship.
Closing date	Open until the postdoctoral fellowship is filled.
Focus	This project proposes the development of a unified, extensible framework for the evaluation of procedural content generation (PCG) systems, specifically focused on game level generation. It aims to standardise the way we measure, compare, and interpret the outputs of generative systems across a variety of video game genres and content representations. The project is fundamentally interdisciplinary, bridging computer science with creative digital arts and design to build an evaluation protocol that is as computationally rigorous as it is creatively insightful. The key innovation lies in designing a framework that unifies quantitative metrics (e.g., solvability, complexity, entropy, playability) and qualitative assessments (e.g., aesthetic coherence, novelty, player preference). Furthermore, the project will incorporate learned evaluation models derived from large-scale human judgment studies, establishing a hybrid evaluation protocol that mirrors how humans perceive game level quality. The proposed system will enable systematic testing and ranking of level generators across both handcrafted and AI-driven models (e.g., grammar-based, search-based, GANs, transformer-based models, and RL agents). The resulting tools, datasets, and evaluation reports will be released as open-source contributions, supporting reproducibility and facilitating broader adoption in both academic and game development communities.
Research Experience	Demonstrable research and/or professional experience in relevant areas: • Advanced algorithm development: We are particularly interested in candidates with a strong background in the development of procedural content generation algorithms, including search-based, grammar-based, GAN-based, diffusion, transformer and reinforcement learning approaches. Applicants should have experience specifically with game level

	generation rather than generative techniques limited to images or textual data. Prior involvement in the benchmarking or systematic comparison of generative systems is highly desirable, as is familiarity with representation learning techniques for game levels or maps, such as latent space modelling, embedding methods or graph-based representations. • Project and resource management: demonstrable experience in planning and delivering research, including budgeting, timelines, and coordination. • Student supervision: experience supervising postgraduate students.
Expectations	• Conduct original, high-quality research in the field, working both independently and within interdisciplinary teams, and collaborating proactively with colleagues across MIND and other Schools. In the School of Computer Science and Applied Mathematics, as well as the School of Digital Arts. • Publish in accredited journals and leading conferences, targeting an average of at least two peer-reviewed outputs per year, preferably in international, indexed venues. (e.g., AIIDE, CoG, FDG, CHI, NeurIPS). • Mentor and co-supervise Doctoral and Master's students pursuing research in AI and Games, contributing to a supportive and rigorous research training environment. • Drive innovation by proposing and testing new ideas; contribute to the MIND Institute's research culture through seminars, discussion groups, and academic service. • Support the operation and sustainability of MIND laboratories and facilities where appropriate, including good research practice, documentation, and safety. • Contribute to the University's strategy to sustain its standing as an internationally acclaimed, research-intensive institution. • Contribute to the sustainability and fundraising efforts of the MIND Institute through grant and funding applications, as well as partnerships and stakeholder relationships. • Build your research profile and that of the MIND Institute through presentations, outreach, media opportunities, and a professional online presence.
Benefits	• Mentorship and professional development: structured mentorship, training and guidance from experienced researchers to build research independence. • Research profile: strengthen your CV through targeted, high-quality research outputs. • Academic experience: gain experience in teaching, supervision, mentorship and related academic activities. • Project leadership: develop skills in project conception, experimental design and research management. • Impact: engage in cutting-edge research and contribute to the growth of African-led AI.
Queries	Dr Brandan Ingram, Branden.Ingram@wits.ac.za MIND Grant Manager, info.mind@wits.ac.za