

Colonoscopy Patent

The Pre-Colonoscopy Readiness Device is an AI-assisted multimodal diagnostic platform designed to objectively assess bowel-preparation quality before colonoscopy, addressing a critical failure point in colorectal cancer screening: ~25% of colonoscopies involve inadequate bowel cleansing, which can obscure lesions, reduce adenoma detection, prolong procedures, and increase the likelihood of repeat examinations. Its development progressed from standardized effluent imaging using controlled illumination and reticle-based calibration to a fluid-analysis system incorporating magnetic stirring, controlled fluid flow, viscosity and stickiness indicators, and optical/chemical sensors. I developed a multimodal analysis pipeline combining image-derived features - including colour, turbidity, particle concentration and size - with sensor and patient data. The architecture incorporates class-conditioned GANs for synthetic image generation, CNNs for visual feature extraction, and an RNN for multimodal prediction of BBPS-linked bowel-preparation quality, with subsequent clinical outcomes providing feedback for model refinement.

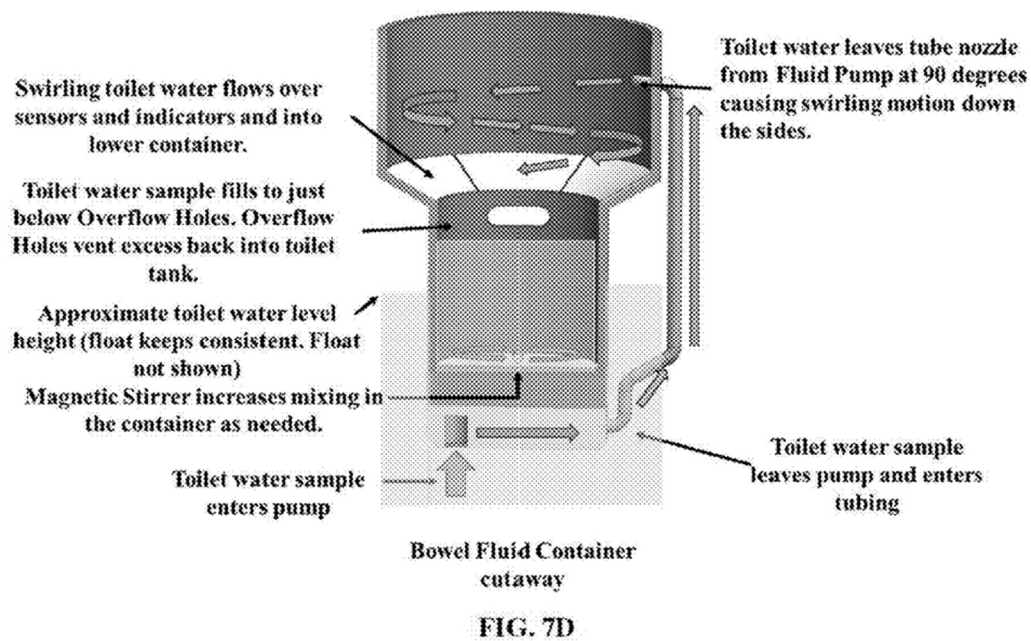


Fig. – Diagrams of the magnetic stirring embodiment

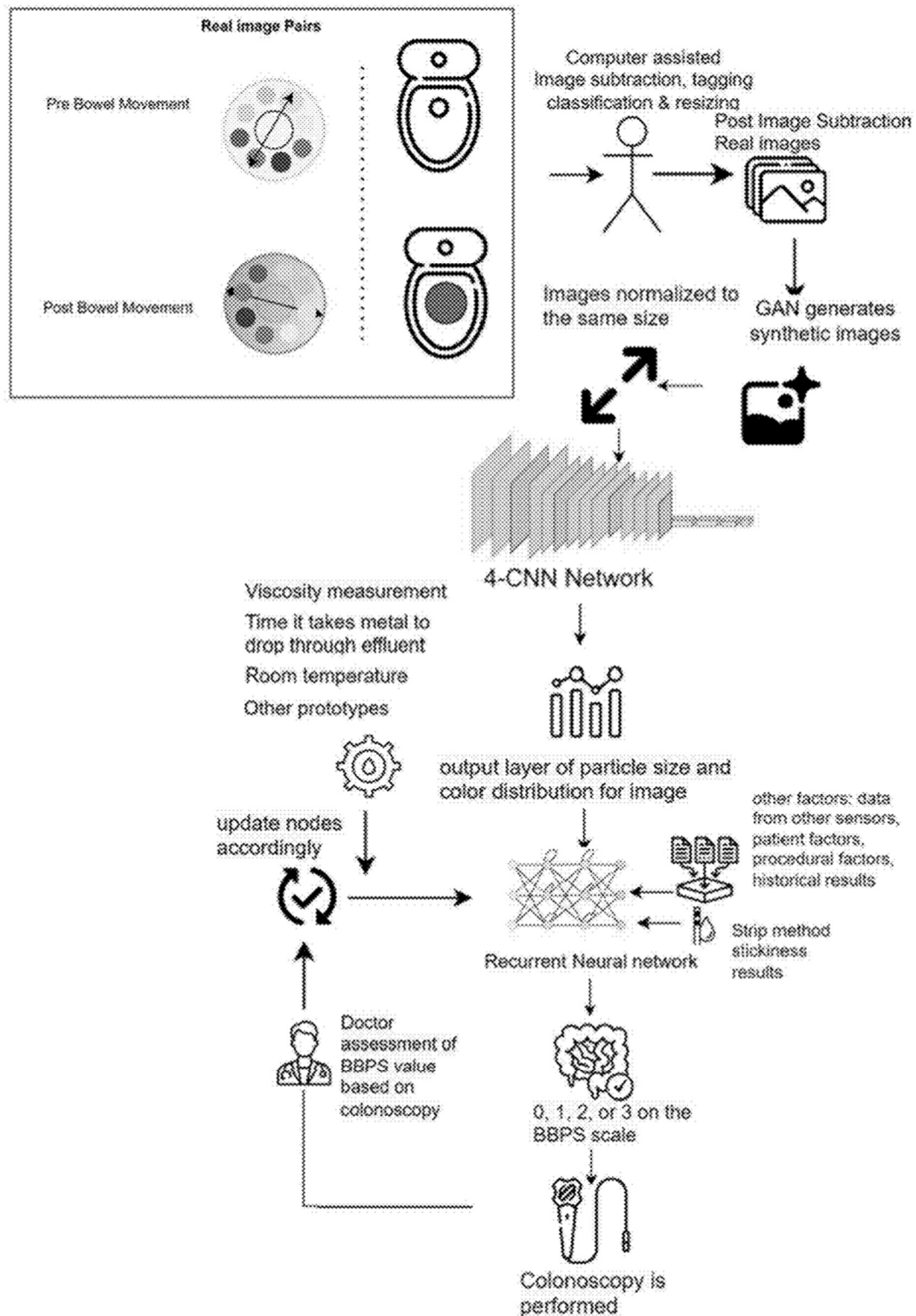


Fig. – CNN, RNN, GAN architecture flowchart