

# Provisional Patent Application Draft

Filing Date: May 24, 2025

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Title: Photo-Based Diagnostic Scoring System for Plumbing Installations (NeuraPlumb)

## Invention Summary

This invention relates to an AI-powered diagnostic system that evaluates plumbing work by analyzing photographic submissions of completed or in-progress installations. The system generates a numeric score, known as a NeuraScore, which reflects the visible quality, craftsmanship, and code alignment of the work.

The invention addresses the widespread problem of non-transparent plumbing quality, particularly for homeowners and clients who lack prior plumbing knowledge. Traditionally, clients must rely solely on a plumber's word or conduct extensive self-research to determine if a job was performed correctly. This creates uncertainty, potential hazards, and a lack of trust.

NeuraPlumb provides a universal scoring system that allows clients to instantly understand whether the visible plumbing work is urgent, non-urgent, acceptable, excellent, or exceptional without requiring technical knowledge. It enhances client confidence and speeds up decision-making by using objective AI evaluation.

For plumbers, the tool offers a third-party validation of their work quality. It enables experienced and inexperienced technicians alike to benchmark their craftsmanship, detect oversights, and communicate more clearly with clients using a shared diagnostic language. NeuraPlumb's scoring system can be used pre-inspection to improve installation quality, reduce safety risks, and increase client satisfaction through early corrections.

The system also offers built-in educational and trust-based messaging layers to help bridge the communication gap between tradespeople and homeowners, while promoting transparency and safety within the plumbing industry.

While the diagnostic system provides valuable insight, results are based solely on visual analysis and are not guaranteed to be fully accurate or comprehensive. It should be treated as an advisory

tool, not a replacement for licensed inspections, pressure testing, or in-person evaluations.

The scoring logic is continuously reviewed and refined by experienced plumbing professionals to ensure the system remains grounded in real-world practices and field standards.

#### System Claims (Protected Capabilities)

- NeuraScore: A 15 numeric scoring system based solely on visible plumbing quality in submitted photos.
- Trust Messaging System: AI-generated, human-friendly language explaining scores to non-professional clients.
- Legendary Tier: A hidden scoring badge that appears only when work exceeds elite field standards.
- Difficulty Rating Logic: A scale from Simple to Extreme that reflects labor intensity, access limitations, or environmental challenges.
- Scope-Based Evaluation Filtering: Logic that adjusts evaluation based on the plumbers declared scope of work.
- Client Report Format: Visual and textual layout that shows score, summary, observations, and educational tooltips.
- Craftsmanship Signal Recognition: System identifies specific indicators such as solder quality, pipe alignment, insulation, or hardware consistency.
- Above and Beyond Recognition Logic: Optional flags for exceptional work not required by code.
- Color-Coded Badge System: Intuitive color-matched scoring badges (e.g., red to gold or 15 visual scale).
- Plumber Motivation UX: System gamifies quality by rewarding high scores and encouraging corrections or resubmissions.

#### Method of Operation

The NeuraPlumb system operates through a structured, photo-based diagnostic process that evaluates plumbing work for visible quality, safety, and craftsmanship using artificial intelligence. The process includes distinct flows for both plumbers and homeowners, with built-in features for

company owners and managers.

#### Client/User Flow:

1. Homeowner uploads one or more plumbing-related photographs.
2. Each photo is tagged with a timestamp and optional geolocation metadata.
3. AI analyzes craftsmanship signals: pipe alignment, joint quality, soldering, corrosion, signs of leakage.
4. System generates a NeuraScore (15) based on safety, symmetry, cleanliness, and professionalism.
5. If critical issues are detected, an alert is sent advising urgent plumber contact.
6. The client receives a summary, with options for basic or advanced plumbing language.

#### Plumber Flow:

1. Plumber uploads photo for score or internal tracking.
2. System returns score with improvement tips.
3. Plumber can submit progress photo for re-evaluation.
4. Scores of 4 or 5 unlock badges.
5. Reports can be saved, shown to client, or used for training.

#### Manager Dashboard:

1. View technician scores, trends, audit history.
2. Monitor performance and training needs.
3. Use photos as proof, education, and dispute resolution.
4. Trust layer enhances company reputation without replacing official reviews.

Each photo is tagged with a timestamp and optional GPS metadata to confirm when and where submissions were made. This helps prevent reuse of photos from other jobs and adds a verifiable audit trail.

#### Future Expansion Claims

- Smart Job-Type Recognition: Detects or allows selection of plumbing job types to apply context-specific scoring.

- Human-in-the-Loop Feedback: Allows plumbers or managers to flag inaccuracies to refine AI over time.
- Parts Reference System: Offers suggestions for tools, repairs, or product links based on diagnosis.
- Technician History Profiles: Tracks plumber performance, badge history, and optional public records.
- Training Mode: A non-client scoring mode used for technician practice and company onboarding.
- Dual-Acknowledgment System: Allows clients and plumbers to co-sign reports to confirm shared visibility of results.