RFML

Radio Frequency Motion Layer

Identity captured at source, not inferred from pixels.

A deterministic metadata layer for video production that binds physical object identity to pixel-space representation at the moment of filming — using RF tags, localization infrastructure, camera calibration, and SMPTE timecode.

● Provisional Patent Filed   ● Prototype In Development   ● SMPTE Standards Compatible

HOW IT WORKS

01 TAG

Attach RF/UWB tags to physical objects. Each tag provides unique identity + position.

02 LOCALIZE

Fixed anchors define a world coordinate frame. 10–100 Hz updates, centimeter-level accuracy.

03 PROJECT

RFML Bridge fuses RF positions with camera pose, lens calibration, and SMPTE timecode.

04 OUTPUT

Per-frame metadata: object ID, world-space position, pixel bounding box, and confidence.

THE SHIFT

COMPUTER VISION (INFERENCE)

- ✗ Probabilistic — guesses identity from pixels
- ✗ Degrades under occlusion and lighting changes
- ✗ Cannot distinguish identical-looking items
- ✗ Requires retraining for new products
- ✗ No timecode synchronization
- ✗ Not archival or auditable

RFML (DETERMINISTIC)

- ✓ Deterministic — captures identity at source
- ✓ Works through occlusion and any lighting
- ✓ Distinguishes any tagged object by unique ID
- ✓ No retraining — identity is a physical signal
- ✓ Frame-accurate SMPTE timecode sync
- ✓ Full pipeline preserved for audit & re-projection

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METADATA SCHEMA — ONE JSONL RECORD PER FRAME

```
   ●  ●  ●              sidecar.jsonl

  {
    "timecode": "01:02:03:12", "frame": 110592, "fps": 24.0,
    "camera": {
      "serial": "CAM_01",
      "pose_world": { "x": 1.234, "y": 0.456, "z": 1.789 },
      "intrinsics_id": "LENS_PROFILE_35MM_T2", "focal_mm": 35.0
    },
    "objects": [{
      "object_id": "JKT_0142", "tag_id": "uwb:0xA17C9B2E",
      "class": "wardrobe",
      "world_pose": { "x": 3.12, "y": 1.07, "z": 0.92 },
      "pixel_bbox": { "x": 812, "y": 214, "w": 188, "h": 402 },
      "confidence": 0.91, "sku_refs": ["SKU_881223"]
    }]
  }
```

Both world-space position and pixel-space projection preserved — enabling post-production re-projection.

APPLICATIONS

Interactive Commerce

Viewers select objects to purchase.
SKU-level identity, not category-level.

Continuity & Clearance

Automated tracking of which objects
appear in which shots.

Production Analytics

Object-level engagement metrics,
conversion funnels, temporal trends.

Rights Management

Per-object licensing constraints by
territory, time window, or channel.

Sports & Live Broadcast

Deterministic player/gear ID for
real-time overlays and statistics.

AR & Extended Reality

Object identity and pose streams
for AR overlays on companion devices.

Get in Touch

If you work in production technology, interactive video,
or shoppable media — I'd like to hear from you.

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