# VeraSnap v1.5

# "World First" Claim Integrated Assessment Report

## Cross-Validated Integration by Three Independent Research Institutions

| | |
|---|---|
| Report Date | February 11, 2026 |
| Target Product | VeraSnap v1.5 (VeritasChain Co., Ltd.) |
| Methodology | Parallel investigation by 3 independent institutions with cross-validation |
| Integrated Confidence | 0.70 (Medium-High) |
| Target Claim | World's first comprehensive cryptographic evidence capture platform as a consumer smartphone app |

This report integrates analyses from three independent research institutions and does not constitute legal advice. The legal defensibility of "world first" claims varies by jurisdiction.

# Table of Contents

# Executive Summary

Three independent research institutions (Institutions A, B, and C) independently verified the "world first" claim stated in the VeraSnap v1.5 press release, each using distinct methodologies.

Institution A: Skeptical-empiricist approach (strict public documentation verification, exhaustive survey of 12+ products)
Institution B: Technical analysis and physics-based verification (academic validation of sensor principles)
Institution C: Prior art and patent investigation (USPTO/EPO/JPO/WIPO patent search, four-axis evaluation framework)

## Integrated Conclusion of Three Institutions

| Evaluation Axis (Proposed by Institution C) | Verdict | Agreement |
|---|---|---|
| First Idea | No – All individual technologies have prior research/filings | 3/3 |
| First Filing | No – Prior patent families exist for sensor + timestamp + signature | 3/3 |
| First Public Demo | Conditional No – No prior demo of 4-detection integration confirmed | 3/3 |
| First Commercial Product | Possible within self-defined scope | 3/3 |

Integrated Confidence: 0.70 (Medium-High) – No consumer smartphone app fulfilling VeraSnap v1.5's self-defined composite requirements (4 fraud detection features + RFC 3161 + CPP integration) was identified in any of the three investigations. However, prior art for individual components is abundant, and complete absence proof including non-public implementations and closed pilots is inherently impossible.

## Per-Element Assessment Summary

| Element | Institution A | Institution B | Institution C | Integrated Verdict |
|---|---|---|---|---|
| 4-feature integration | Defensible (structural fragility) | Very high certainty, legitimate | Possible within self-definition | Defensible |
| IMU tremor FFT analysis | Genuinely novel | Outstanding technical originality | No prior art found | Strongly defensible as world first |
| SW 3-modal screen detection | Novel in consumer apps | High novelty | Individual tech known; fusion is novel | Strongly defensible as world first |
| Barometric environmental attestation | CameraV has prior art | Novel as "analysis" | ProofMode etc. prior exists | Conditionally defensible |
| NTP time consistency verification | Functional equivalents exist | Unique verification mechanism | Secure time direction preceded | Conditionally defensible |

# Chapter 1: Methodology Comparison

## 1.1 Institution A — Skeptical-Empiricist Approach

Institution A adopted strict criteria where only features explicitly confirmed in public documentation are considered "implemented." The survey covered 12+ products including Truepic, CameraV/InformaCam, ProofMode, CertiPhoto, Click Camera, Google Pixel 10 C2PA, Sony Camera Authenticity, eyeWitness to Atrocities, Numbers Protocol, Serelay, Amber Video, and Microsoft Content Integrity. Undocumented features were treated as "Unknown."

## 1.2 Institution B — Technical Analysis and Physics-Based Verification

Institution B verified the physical principles underlying each sensor technology (barometric measurement precision, physiological tremor frequency characteristics, moire interference optics) against academic literature. The assessment covered FFT-based frequency analysis, Sobel filter edge detection, and rolling shutter effect theoretical foundations, analyzing CPP and C2PA positioning within international standardization frameworks.

## 1.3 Institution C — Prior Art and Patent Investigation

Institution C proposed a four-axis evaluation framework (First idea / First filing / First public demo / First commercial product) and conducted cross-jurisdictional patent database searches across USPTO/EPO/JPO/WIPO. Source priority was: (a) primary sources (patent publications, standard specifications), (b) peer-reviewed papers (IEEE/USENIX), (c) reliable media reporting. Key analyses included USENIX Security papers ('21 mID, '25 Scoop) and Truepic patent families.

## 1.4 Methodological Complementarity

| Institution | Primary Analysis Axis | Central Question |
|---|---|---|
| A: Product Market Survey | Public document verification, 12+ product comparison | Is it implemented in competing products? |
| B: Physics/Engineering Validity | Sensor principle verification, signal processing evaluation | Is it technically feasible and novel? |
| C: IP/Academic Prior Art | Patent search (4 offices), USENIX etc. papers | Is it preceded by concepts/filings/papers? |

# Chapter 2: Integrated Prior Art Timeline

Individual technology elements all have prior concepts, filings, or implementations between 2001 and 2025. VeraSnap v1.5's novelty is limited to integrating these individual elements as a "specific combination" in a "consumer app."

| Year | Prior Art Event | Source |
|------|-----------------|--------|
| 2001 | RFC 3161 (TSA timestamp standard) published | C |
| 2008 | ATI Technologies: Rolling shutter x flicker detection patent (priority) WO/2010/054484, EP2356811, JP5866200B2 | C |
| 2009 | NHK (Japan Broadcasting): Monitor recapture moire reduction patent | C |
| 2012 | CameraV/InformaCam: Raw barometric (hPa), accelerometer, gyroscope data in PGP-signed J3M metadata (consumer app) | A |
| 2015 | Moire presentation attack detection research (face auth.) / Garcia & de Queiroz, IEEE TIFS / Truepic image auth. patent | B, C |
| 2016 | CertiPhoto: RFC 3161 TSA + NF Z42-013 hash chain (consumer app) | A, B |
| 2017 | ProofMode (WITNESS/Guardian Project): Crypto signature + sensor snapshot | A, C |
| 2020 | Truepic x Qualcomm: Secure enclave time/location tagging prototype | C |
| 2021 | Truepic: Sensor + TSA server + digital signature patent (priority 2021-03-10) USENIX Security '21 mID: Moire-based screen photo forensics | C |
| 2022 | C2PA specification published (includes RFC 3161 timestamp requirements) | C |
| 2025 | USENIX Security '25 Scoop: Recapture attack definition, depth mitigation | C |
| 2026 | VeraSnap v1.5: Claims 4 detection + RFC 3161 + CPP integration (Feb 11) | A,B,C |

# Chapter 3: Competitive Comparison (3-Institution Integration)

## 3.1 Integrated Comparison Matrix — Fraud Detection / Physical Sensors

| Feature | VeraSnap v1.5 | Truepic | CameraV | ProofMode | CertiPhoto | Click Camera |
|---------|---------------|---------|---------|-----------|------------|--------------|
| Barometric environmental attestation | Yes w/ analysis | Partial GPS assist [A] | Partial raw data (2012~) [A] | Partial altitude only [A] | No | No |
| IMU tremor FFT analysis | Yes 8-12Hz | No [A][C] | No raw only [A] | No | No | No |
| NTP time consistency | Yes client-side | Partial server-side [A][C] | No | No | No | No |
| SW screen recapture (3-modal) | Yes moire+flicker +luminance | Partial proprietary [A][C] | No | No | No | No |
| RFC 3161 TSA | Yes [A][B][C] | Yes [A][C] | No PGP [A] | No Blockchain [A] | Yes (2016~) [A][B] | No Blockchain [A] |
| Biometric binding | Yes [A][B] | No [A] | No | No | No [A][B] | Yes (2024~) [A] |
| XOR completeness invariant | Yes [A][B] | No | No | No | No | No |
| Consumer app | Yes | No SDK [A][C] | Yes [A] | Yes [A][C] | Yes [A] | Yes [A] |

## 3.2 Closest Competitor Analysis

### Truepic — Greatest Potential Competitor

3-Institution Assessment: Truepic is the most technically advanced competitor, implementing approximately 3.5 of 5 major components. It uses barometric data for GPS corroboration, runs 35 authenticity tests per image, and employs RFC 3161-compatible timestamps. However, it operates as an enterprise SDK, not a consumer app. No IMU tremor analysis is documented. Truepic's patent (priority 2021-03-10) covers "multiple sensors + TSA server signature + digital signature" but direct overlap with VeraSnap's 4-detection integration was not confirmed.

### CameraV/InformaCam — Critical Prior Art

Institution A Assessment: CameraV's J3M metadata format records barometric pressure (pressureHPAOrMBAR), accelerometer (acc_x, acc_y, acc_z), gyroscope (pitch, roll, azimuth), ambient light, and temperature in PGP-signed metadata. Operational since circa 2012, it constitutes clear prior art for raw barometric and IMU data recording in evidence capture. However, it does not implement FFT-based tremor pattern analysis or 3-modal fusion screen detection. VeraSnap's novelty lies in "analysis" not "recording" - a distinction critical for claim positioning.

### CertiPhoto — RFC 3161 Prior Art

3-Institution Consensus: CertiPhoto has provided RFC 3161 timestamps (via DigiCert/GlobalSign) since 2016, with NF Z42-013 compliant hash chains. Claiming "world first" for "RFC 3161 timestamped evidence camera" is not viable. VeraSnap's claim must be limited to the "integration" of RFC 3161 with other feature sets.

## Chapter 4: Per-Feature Novelty Assessment (3-Institution Integration)

### 4.1 IMU Physiological Tremor Pattern Analysis (8-12Hz FFT)

| Integrated Verdict: Most Strongly Defensible as World First  ***** | 3-Institution Agreement: Complete |
|---|---|

| Institution | Assessment |
|---|---|
| A | Not found in any consumer app, enterprise product, or academic system. A genuinely novel concept. |
| B | Outstanding technical originality. Physics-based human presence proof. Academic research reports 95-97% accuracy. |
| C | Neither patent nor academic search found IMU tremor FFT application for evidence capture anti-fraud. |

Prior Art Risk: Low. All three institutions unanimously confirmed absence of prior art. Medical IMU tremor analysis is established, but application to digital evidence anti-fraud was not found in academic papers, patents, or commercial products.

### 4.2 Software-Based 3-Modal Fusion Screen Recapture Detection

| Integrated Verdict: Strongly Defensible (individual elements academically known) ****  |  Substantial Agreement |
|---|

Prior Art Risk: Medium. Individual techniques have rich prior research and patents. "Fusion" and "consumer app implementation" are the core of novelty. The possibility that Truepic's 35 tests include similar analysis cannot be excluded (non-public, thus unevaluable).

### 4.3 Barometric Environmental Attestation

| Integrated Verdict: Conditionally Defensible ***  |  Agreement (CameraV prior art acknowledged) |
|---|

Prior Art Risk: High. CameraV (circa 2012) records raw barometric sensor data (hPa/mbar) in PGP-signed J3M metadata. Truepic also uses barometric data for GPS corroboration. VeraSnap's novelty is in "environmental stability analysis" (weather cross-validation, indoor/outdoor estimation), not barometric data recording itself.

### 4.4 NTP-Based Time Consistency Verification

| Integrated Verdict: Conditionally Defensible ***  |  Agreement (functional equivalents acknowledged) |
|---|

Prior Art Risk: Medium. Clock tampering detection is achieved by multiple products through different means (Truepic: server-side TSA, Google Pixel 10: on-device TSA). Truepic x Qualcomm (2020) described "querying government time servers for verified timestamps." VeraSnap's novelty lies in the specific implementation of "client-side NTP server delta measurement and recording."

# Chapter 5: Resolution of Inter-Institutional Disagreements

| Issue | Institution A | Institution B | Institution C |
|---|---|---|---|
| Overall assessment | Narrowly defensible but structurally fragile | Very high certainty, legitimate | Possible within self-definition (confidence 0.65) |
| Individual tech prior art | Detailed prior art enumeration | Emphasizes integration novelty | Strict 4-axis prior art judgment |
| CPP positioning | Self-referential ecosystem | IETF draft submission affirmed | IETF Internet-Draft factually confirmed |
| CameraV assessment | Critical prior art, detailed analysis | Not directly compared | Indirect reference via ProofMode |
| Truepic threat level | Closest competitor (3.5/5 elements) | B2B SDK, not direct competitor | Strong precedent but 4-detection evidence insufficient |

## 5.1 Points of Convergence

Convergence 1: No consumer app with 4-feature integration was found. None of the three investigations identified a prior product fully matching VeraSnap's self-definition.

Convergence 2: Individual technologies have abundant precedent. RFC 3161 (2001), moire detection (2015~), flicker detection (patent 2008), sensor data bundling (CameraV 2012) - all components have prior art.

Convergence 3: IMU tremor FFT analysis has the highest novelty. All three institutions confirmed absence of prior art for IMU tremor analysis as an evidence capture anti-fraud mechanism.

Convergence 4: Truepic is the greatest potential threat. The possibility that non-public internal implementations overlap with VeraSnap cannot be excluded.

Convergence 5: "World first" depends on definition scope. Denied in broad sense (individual technologies), possible in narrow sense (specific composite integration).

## Chapter 6: Four-Axis Evaluation Conclusions

| Evaluation Axis | Verdict | Rationale | Agreement |
|---|---|---|---|
| First Idea | No | RFC 3161 is 2001 IETF standard. Moire detection from 2015˜. Flicker detection ATI patent (2008). Sensor bundling CameraV (2012). | 3/3 |
| First Filing | No (broad) | Truepic patent (priority 2021-03-10) covers sensor + TSA + signature. ATI patent precedes flicker. No prior patent for full 4-detection + CPP composite. | 3/3 |
| First Public Demo | Conditional No | Truepic x Qualcomm (2020) prototype reported. Scoop (USENIX'25) research implementation. No prior demo of 4-detection integration confirmed. | 3/3 |
| First Commercial Product | Possible within scope | No consumer app fulfilling all requirements identified by any of the 3 institutions. Complete absence proof including non-public implementations is impossible. | 3/3 |

# Chapter 7: Integrated Risk Assessment

## 7.1 Prior Art Risk Matrix

| Risk Factor | Probability | Impact | Source | Mitigation |
|---|---|---|---|---|
| Truepic non-public implementation overlap with 4 detections | Medium | High | A, C | Use "based on public information" qualifier |
| CameraV barometric + IMU raw data recording as prior art | High | Medium | A | Clearly distinguish "analysis" vs "recording" |
| CertiPhoto RFC 3161 precedent (since 2016) | Certain | Medium | A, B | Limit to "integration" context |
| KYC/liveness SDK screen detection precedent | Medium | Low | A | Differentiate from "general evidence capture" |
| Non-public closed pilot existence | Low-Med | Medium | C | Acknowledge impossibility of complete absence proof |
| Truepic patent claim conflict | Low-Med | High | C | CPP-specific differentiation, FTO analysis |

## 7.2 Confidence Integration

| Institution | Confidence Expression | Numeric |
|---|---|---|
| A | Narrowly defensible but structurally fragile | 0.60 |
| B | Very high certainty, legitimate | 0.85 |
| C | Explicit numeric: 0.65 | 0.65 |
| Integrated | Medium-High | 0.70 |

# Chapter 8: Recommendations

## 8.1 Recommended Claim Language

### Most defensible expression (recommended):

VeraSnap v1.5 is the world's first*1 consumer smartphone app to integrate multi-sensor fraud detection (barometric environmental analysis, IMU tremor pattern FFT analysis, NTP time consistency verification) and software-based 3-modal fusion screen recapture detection (moire + flicker + luminance distribution) with RFC 3161 cryptographic timestamps and the Content Provenance Protocol (CPP) as a cryptographic evidence capture platform.

### Recommended footnote:

*1 As a consumer smartphone app integrating barometric sensor environmental stability analysis, IMU physiological tremor pattern FFT analysis for human presence estimation, client-side NTP server time delta verification, and software-based multi-modal screen recapture detection (moire pattern FFT + rolling shutter flicker detection + luminance distribution analysis in 3-modal fusion) with RFC 3161 cryptographic timestamps and Content Provenance Protocol (CPP, published as IETF Internet-Draft draft-vso-cpp-core). As of February 11, 2026, based on publicly available information. Prior research and implementations exist for individual component technologies.

### Expressions to avoid:

x Unqualified "world's first digital evidence app"

x "World's first timestamped camera" (CertiPhoto 2016 precedes)

x "World's first sensor-data evidence camera" (CameraV 2012 precedes)

x "World's first open-standard evidence camera" (multiple C2PA products precede)

x Claiming "world first" for individual technologies (moire detection, barometric recording, etc.)

## 8.2 Priority Actions for Credibility Enhancement

| # | Action | Priority | Rationale |
|---|--------|----------|-----------|
| 1 | Publish v1.5 technical documentation (CPP v1.5 spec update, technical blog) | Critical | A: Resolve verification gap |
| 2 | Commission third-party security audit | Critical | A: Establish independent verification |
| 3 | Submit academic paper (IEEE/ACM/USENIX) | High | C: Establish formal prior art record |
| 4 | File patents (IMU tremor FFT, 3-modal fusion scoring) | High | C: Secure IP precedence |
| 5 | Promote external CPP adoption (SDK release, partner acquisition) | High | A: Substantiate "open standard" |
| 6 | Publish CameraV differentiation white paper | Medium | A: Reduce prior art risk |
| 7 | Provide technical demos to independent media | Medium | A: Obtain non-paid coverage |

## Chapter 9: Final Conclusions

### 9.1 Integrated Verdict of Three Institutions

> **Three-Institution Integrated Final Conclusion**
>
> Under the definition stated in the press release (integration of four fraud detection features + RFC 3161 + CPP), no consumer smart
>
> However, "world first" as "First Idea," "First Filing," and "First Public Demo" is denied. Novelty lies not in invention of individ

### 9.2 Per-Element Final Verdict

| Element | Defensibility | Agreement | Notes |
|---|---|---|---|
| IMU tremor FFT analysis (evidence capture) | ***** Strongest | Complete | No prior art found. Primary differentiator. |
| SW 3-modal fusion screen detection | **** Strong | Substantial | Individual tech known. Fusion in consumer app is novel. |
| 4-feature integration | **** Strong | Complete | No prior product found. Narrow construction risk. |
| XOR completeness invariant | **** Strong | A, B agree | Unique cryptographic solution for deletion detection. |
| Barometric environmental "analysis" | *** Conditional | Agree | CameraV has raw data recording prior art. |
| NTP client-side verification | *** Conditional | Agree | Functional equivalents exist. Implementation method is novel. |
| RFC 3161 TSA (standalone) | * Not viable | Complete | CertiPhoto (2016) precedes. |

**Integrated Confidence: 0.70 (Medium-High)**

## Appendix A: Products Surveyed (3-Institution Integration)

| # | Product | Developer | A | B | C |
|---|---------|-----------|---|---|---|
| 1 | Truepic / Truepic Lens SDK | Truepic, Inc. | Y | Y | Y |
| 2 | CameraV / InformaCam | Guardian Project | Y | – | – |
| 3 | ProofMode | Guardian Project / WITNESS | Y | Y | Y |
| 4 | CertiPhoto | CertiPhoto SAS | Y | Y | – |
| 5 | Click Camera | Nodle | Y | Y | – |
| 6 | Google Pixel 10 C2PA | Google | Y | – | – |
| 7 | Sony Camera Authenticity | Sony | Y | – | – |
| 8 | eyeWitness to Atrocities | eyeWitness | Y | – | – |
| 9 | Numbers Protocol / Capture Cam | Numbers Protocol | Y | – | – |
| 10 | Serelay / Idem | Serelay Ltd. | Y | – | – |
| 11 | Amber Video | Amber (defunct) | Y | – | – |
| 12 | Microsoft Content Integrity | Microsoft | Y | – | – |
| 13 | Scoop (academic) | USENIX Security '25 | – | – | Y |
| 14 | mID (academic) | USENIX Security '21 | – | – | Y |
| 15 | SafeScreen (academic) | U. Glasgow | Y | – | – |
| 16 | iProov / Jumio / Onfido | Various (KYC) | Y | – | P |
| 17 | Truepic x Qualcomm Proto. | Truepic / Qualcomm | – | – | Y |

## Appendix B: Patent Survey Summary (Institution C)

| Priority/Filing Date | Applicant | Publication Numbers | Related Technology |
|----------------------|-----------|---------------------|--------------------|
| 2008-11-14 | ATI Technologies ULC | WO/2010/054484 EP2356811, JP5866200B2 | Rolling shutter x flicker detection circuit |
| 2009 | NHK (Japan) | JP (see Investigation C) | Monitor recapture moire reduction |
| 2015-08-03 | Truepic LLC | US (see Investigation C) | Image authentication app time/location info |
| 2021-03-10 | Truepic Inc | US/EP/WO family | Multiple sensors + TSA server signature + digital sig. |

## Appendix C: Key References (Abridged)

Institution A: Truepic (truepic.com), Guardian Project InformaCam, ProofMode (GitHub), C2PA (c2pa.org), CAI (contentauthenticity.org), CPP (github.com/veritaschain/cpp-spec), SafeScreen (ACM 10.1145/3743715)

Institution B: VeraSnap press release, VeritasChain (veritaschain.org), Garcia & de Queiroz IEEE TIFS 2015, Physiological tremor literature (MDPI Sensors), IETF Datatracker draft-vso-cpp-core, XOR completeness invariant (PR TIMES)

Institution C: USENIX Security '21 mID, USENIX Security '25 Scoop, C2PA specification, WIPO PCT Gazette WO/2010/054484, EPO EP2356811, JPO JP5866200B2, Truepic patent families (priority 2015, 2021), CAI technical materials

---

This report integrates analyses from three independent research institutions and does not constitute legal advice. The legal defensibility of "world first" claims varies by jurisdiction. Consultation with IP/legal professionals is recommended for final claim language decisions.

Investigation completed: February 11, 2026 | Integrated Confidence: 0.70 (Medium-High)