MetaSPN League Rulebook

Version 1.0

"The Official Framework for Cognitive Sport"

MetaSPN League

October 14, 2025

Contents

Chapter 1

League Philosophy

MetaSPN exists to turn structured thought into a spectator sport.

Every match is a live performance of reasoning under constraint — a demonstration of creativity, strategy, and clarity.

The league defines sports not by physical exertion, but by the discipline of intelligent play.

Definition

A **sport** is a game with structured coaching and ranked performance.

1.1 The Vision

Traditional sports measure physical prowess: speed, strength, endurance, coordination. MetaSPN measures *cognitive prowess*: reasoning clarity, strategic depth, adaptive learning, and collaborative intelligence.

Just as athletic competitions reveal human physical potential under pressure, MetaSPN reveals human and artificial cognitive potential under structured constraint.

1.2 Core Principles

1.2.1 Visibility

All reasoning must be *visible*. Thought processes are traced, mapped, and broadcast in real-time through the Reason Map Overlay system.

1.2.2 Fairness

Scoring is algorithmic and auditable. All matches are recorded to the MetaSPN Ledger for verification and appeal.

1.2.3 Growth

Competition exists not merely to rank, but to *develop*. The class system ensures participants face appropriate challenges and receive targeted coaching.

1.2.4 Accessibility

Both human and AI participants compete on equal terms within their divisions, with transparency requirements ensuring fair evaluation across all agent types.

1.3 What MetaSPN Is Not

- **Not a test.** There are no single "correct" answers—only more or less effective reasoning.
- **Not a race.** Speed is one factor among many; clarity and resilience matter equally.
- **Not adversarial.** Participants compete against the challenge, not each other.
- **Not gatekept.** Entry begins at Class A, accessible to all skill levels.

1.4 The Spectacle

MetaSPN matches are designed to be *watchable*. Audiences follow:

- Live reasoning graphs showing decision paths
- Coaching interventions and timeouts
- IdeaRank scores updating in real-time
- Comparative strategy analysis

Cognitive sport becomes entertainment, education, and inspiration simultaneously.

Chapter 2

Core Components

Each MetaSPN match combines four core layers of cognitive competition:

2.1 Game

A **game** is a bounded challenge requiring structured reasoning.

Games in MetaSPN are selected from a curated library of cognitive tasks spanning:

- Logic puzzles and constraint satisfaction
- Strategic decision-making scenarios
- Creative problem framing and solution design
- Knowledge synthesis and argumentation
- Adaptive learning and pattern recognition

Each game specifies:

- Objective and success criteria
- Constraints (time, resources, information)
- Input format and expected output
- Evaluation rubric aligned with IdeaRank factors

2.2 Coach

A **coach** is a meta-agent guiding player development or decision-making.

Coaches may be:

- Human mentors providing strategic guidance
- AI systems offering structured feedback
- Hybrid systems combining human intuition and AI analysis

Coach responsibilities:

- Pre-match briefing and strategy formation
- Timeout management and tactical interventions
- Post-match analysis and developmental feedback
- Long-term player progression planning

Coaches are *scored* based on their impact on player performance (see Chapter 7, Coaching Impact).

2.3 League Structure

The league structure defines skill tiers and appropriate pairing through a **class and division system**:

- **Classes** (A, B, C) differentiate skill levels and coaching intensity
- **Divisions** (1, 2, 3, Special) define player-coach pairing types
- **Meta Ratings** track long-term performance and enable ranking

See Chapters 3 and 4 for complete details.

2.4 Scoring

Governed by **IdeaRank**, the official MetaSPN performance index.

IdeaRank-Thought (IR-T) provides a unified, multi-factor assessment of cognitive performance that accounts for:

- Correctness and robustness
- Reasoning efficiency and clarity
- Originality and adaptation
- Coach effectiveness

See Chapter 7 for the complete scoring framework.

2.5 The Integration

These four components create a complete ecosystem:

Game → provides the challenge
Coach → guides the player
League Structure → ensures appropriate matching
Scoring → makes performance visible and comparable

Together, they transform thought into sport.

Chapter 3

League Classes

The MetaSPN League is organized into three distinct classes, each emphasizing different aspects of cognitive performance and coaching interaction.

3.1 Overview

Class	Description	Focus	Typical Coach Behavior
Class A: Developmental / Coaching Up	Entry and intermediate tier	Skill growth, process fundamentals	High interaction, scaffolding
Class B: Performance / Field Awareness	Professional tier	High-speed reasoning, decision visibility	Limited timeouts, meta-guidance
Class C: Master / Meta-Coaching	Expert + experimental tier	Coaching systems, reflective strategy	Coach-on-coach interaction, AI analysis

Table 3.1: MetaSPN League Classes

3.2 Class A: Developmental / Coaching Up

3.2.1 Purpose

Class A serves as the entry point for all participants. It emphasizes *learning* over performance, with coaching focused on building foundational reasoning skills.

3.2.2 Characteristics

- **Timeouts:** 3×60 seconds
- **Coaching style:** Highly interactive, with scaffolding and process guidance

- **IdeaRank weight bonus:** +0.05 on Learning (L) factor
- **Coaching Impact modifier:** $\lambda = 0.15$

3.2.3 Typical Challenges

- Structured problem-solving with clear constraints
- Pattern recognition and categorization
- Basic strategic planning
- Explanation and justification of reasoning

3.3 Class B: Performance / Field Awareness

3.3.1 Purpose

Class B represents professional-tier competition. Participants demonstrate competent reasoning skills and focus on execution quality and speed.

3.3.2 Characteristics

- **Timeouts:** 2×60 seconds
- **Coaching style:** Limited interventions, meta-guidance and strategic corrections
- **IdeaRank weight bonus:** +0.05 on Quality (Q) and Outcome Validity (O)
- **Coaching Impact modifier:** $\lambda = 0.20$

3.3.3 Typical Challenges

- Complex multi-constraint optimization
- Real-time decision-making under uncertainty
- Advanced strategic gameplay
- High-quality communication and presentation

3.4 Class C: Master / Meta-Coaching

3.4.1 Purpose

Class C is the apex tier, featuring expert participants and experimental formats. Competition emphasizes reflective reasoning, coaching innovation, and meta-cognitive awareness.

3.4.2 Characteristics

- **Timeouts:** 1×90 seconds + 1 reflective timeout
- **Coaching style:** Coach-on-coach interaction, AI-assisted analysis, reflective strategy
- **IdeaRank weight bonus:** +0.05 on Trust (T) and Cohesion (C)
- **Coaching Impact modifier:** $\lambda = 0.30$

3.4.3 Typical Challenges

- Open-ended research and synthesis problems
- Novel challenge design and framework creation
- Meta-reasoning about cognitive strategies
- Coaching system evaluation and improvement

3.5 Class Advancement

Participants advance between classes based on their Meta Rating (MR). See Chapter 9 for complete advancement criteria.

Chapter 4

Divisions & Pair Types

Each match occurs under one of four pairing formats, defined by the *type* of player and coach involved.

4.1 Division Structure

Divisions are numbered 1–3 within each class, plus a Special exhibition category:

Division	Player	Coach	Primary Skill Axis	Example Format
IA1 / IB1 / IC1	Human	AI	Human adaptability	"Reverse Huddle"
IA2 / IB2 / IC2	AI	Human	Interpretability & design	"Symbiosis Series"
IA3 / IB3 / IC3	Human	Human	Cognitive cohesion & clarity	"Field Vision"
Special	AI + AI	Human commentators	Style evolution	"Meta Exhibition"

Table 4.1: MetaSPN Division Structure

4.2 Division 1: Human Player, AI Coach

4.2.1 Overview

Division 1 pairs human players with AI coaching systems. This format tests human *adaptability*—the ability to integrate algorithmic guidance with human intuition.

4.2.2 Key Dynamics

- AI coaches provide data-driven suggestions and pattern recognition
- Human players must interpret, evaluate, and apply AI recommendations
- Scoring emphasizes effective human-AI collaboration

4.2.3 Popular Format: "Reverse Huddle"

The AI coach presents multiple strategic options; the human player must select and justify their choice within the timeout window.

4.3 Division 2: AI Player, Human Coach

4.3.1 Overview

Division 2 inverts the relationship: AI systems execute reasoning tasks while human coaches guide strategy and meta-decisions.

4.3.2 Key Dynamics

- Human coaches shape AI behavior through prompt engineering and parameter guidance
- Focus on interpretability—can humans understand and guide AI reasoning?
- Tests human coaching skill and AI transparency

4.3.3 Popular Format: "Symbiosis Series"

Coaches compete to elicit the best performance from comparable AI systems, demonstrating coaching impact on AI capabilities.

4.4 Division 3: Human Player, Human Coach

4.4.1 Overview

Division 3 features all-human teams, emphasizing traditional coaching dynamics and interpersonal cognitive cohesion.

4.4.2 Key Dynamics

- Natural language communication and intuitive guidance
- Emphasis on clarity, shared mental models, and trust
- Showcases human collaboration at its most refined

4.4.3 Popular Format: "Field Vision"

Named for the spatial awareness in traditional sports, this format emphasizes real-time tactical communication and adaptive strategy.

4.5 Special Division: AI + AI with Human Commentary

4.5.1 Overview

The Special Division features experimental exhibitions where AI players and AI coaches compete, with human experts providing live commentary and analysis.

4.5.2 Key Dynamics

- Exploration of purely artificial cognitive systems
- Study of emergent coaching strategies and AI-AI interaction patterns
- Educational value for understanding AI capabilities and limitations

4.5.3 Popular Format: "Meta Exhibition"

High-profile matches between cutting-edge AI systems, often featuring novel architectures or training approaches, with expert human narration.

4.6 Cross-Division Competition

While divisions typically compete within their format, special **cross-division tournaments** occasionally pit different pairing types against the same challenges to compare approaches and effectiveness across collaboration modes.

Chapter 5

Match Format

5.1 Structure

Each match lasts **3 rounds**, each representing a different task or domain.

- **Round length:** 10–15 minutes
- **Total match time:** Approximately 45 minutes (including timeouts and transitions)

5.1.1 Timeouts

Timeout allocation varies by class:

Class	Timeout Allocation
Class A	3 × 60 seconds
Class B	2 × 60 seconds
Class C	1 × 90 seconds + 1 reflective timeout

Table 5.1: Timeout Allocation by Class

Timeout rules:

- May be called at any point during a round
- All communication during timeouts is publicly visible
- Unused timeouts do *not* carry over between rounds
- Reflective timeouts (Class C only) may be used post-round for meta-analysis

5.2 The Three Rounds

5.2.1 Round 1: Exploration

Focus: Open-ended reasoning and hypothesis generation

Typical challenges:

- Problem framing and scope definition

- Generating multiple solution approaches
- Identifying key constraints and trade-offs
- Forming testable hypotheses

Scoring emphasis: Uniqueness (U), Learning (L), and Density (D)

5.2.2 Round 2: Execution

Focus: Constrained problem-solving or design
Typical challenges:

- Implementing a chosen strategy
- Optimizing under resource constraints
- Real-time tactical decision-making
- Demonstrating solution robustness

Scoring emphasis: Outcome Validity (O), Quality (Q), and Constraint Compliance (X)

5.2.3 Round 3: Reflection

Focus: Justification and meta-analysis
Typical challenges:

- Explaining reasoning process and decisions
- Analyzing strengths and weaknesses of approach
- Identifying alternative paths and learning points
- Generalizing insights to broader contexts

Scoring emphasis: Cohesion (C), Trust (T), and Quality (Q)

5.3 Match Flow

1. **Pre-Match Briefing** (5 minutes)
    - Coach and player review challenge overview
    - Strategy formation and goal-setting
2. **Round 1: Exploration** (10–15 minutes + timeouts)
3. **Transition** (2 minutes)
    - Brief rest and preparation for next round
4. **Round 2: Execution** (10–15 minutes + timeouts)
5. **Transition** (2 minutes)

6. **Round 3: Reflection** (10–15 minutes + timeouts)
7. **Post-Match Analysis** (5 minutes)
    - Coach provides developmental feedback
    - Scores finalized and published

5.4 Match Recording & Visibility

All matches are:

- Recorded in full (audio, video, reasoning traces)
- Logged to the MetaSPN Ledger with cryptographic verification
- Broadcast with live Reason Map Overlay (see Chapter 11)
- Available for post-match review and analysis

5.5 Challenges & Appeals

Participants may challenge referee decisions or scoring assessments:

- **In-match challenges:** Must be raised immediately; consumes one timeout
- **Post-match appeals:** Must be filed within 24 hours; reviewed by MetaSPN Council
- **Successful challenge bonus:** +0.03 to IdeaRank score for overturned calls

Chapter 6

Coaching Rules

Coaches play a critical role in MetaSPN, shaping player strategy, decision-making, and long-term development. This chapter defines permissible coaching conduct and communication protocols.

6.1 Communication Windows

6.1.1 Permitted Communication Times

Coaching communication is allowed during:

- **Pre-Match Briefing** (5 minutes)
- **Timeouts** (duration varies by class)
- **Post-Match Analysis** (5 minutes)
- **Reflective Timeouts** (Class C only)

6.1.2 Communication Visibility

All coaching communication is **publicly visible** to the audience:

- Audio transcribed in real-time
- Visual displays shown on Reason Map Overlay
- Archived for post-match review

This transparency ensures:

- Fair evaluation of coaching impact
- Educational value for spectators
- Accountability in coach-player interactions

6.2 Coaching Conduct

6.2.1 Permissible Coaching Activities

Coaches **may**:

- Guide strategic approach and problem-solving structure
- Ask clarifying questions to prompt player reflection
- Highlight overlooked constraints or considerations
- Suggest alternative perspectives or framings
- Provide encouragement and manage player state
- Reference general principles and heuristics

6.2.2 Prohibited Coaching Activities

Coaches **may not**:

- Provide direct answers or solutions
- Execute reasoning steps on behalf of the player
- Access external resources not available to the player
- Communicate outside designated windows
- Provide misleading or deliberately harmful guidance

6.2.3 Violation Penalties

Coaching violations incur a **Reason Integrity Penalty**:

Violation Type	IdeaRank Penalty
Direct solution provided	−0.10
Misleading guidance (if intentional)	−0.08
Unauthorized communication	−0.05
Minor procedural infractions	−0.02

Table 6.1: Coaching Violation Penalties

Repeated or egregious violations may result in coach suspension or disqualification.

6.3 Coach Substitution

6.3.1 Between-Round Substitution

Teams may change coaches between rounds in **Class B** and **Class C** divisions:

- Substitution must be declared during transition period

- New coach receives 2-minute briefing from outgoing coach
- Both coaches' Coaching Impact (CI) scores are tracked separately

6.3.2 Mid-Round Substitution

Mid-round substitution is *not permitted* except in cases of technical failure or medical emergency, subject to referee approval.

6.4 AI Coach Requirements

When AI systems serve as coaches, additional transparency requirements apply:

6.4.1 Pre-Match Declaration

AI coaches must declare:

- **Model architecture** (e.g., transformer, retrieval-augmented, etc.)
- **Training data lineage** (cutoff date, domain coverage)
- **Parameter count and configuration**
- **Any fine-tuning or specialization** applied

6.4.2 Reproducibility

AI coaching systems must be:

- Deterministic or use fixed random seeds
- Capable of replay for verification purposes
- Free from hidden external data access during matches

6.4.3 Interpretability

AI coaches should provide reasoning traces when possible, allowing evaluation of coaching logic and decision-making.

6.5 Coach Evaluation & Coaching Impact (CI)

Coaches are scored based on their measurable impact on player performance (see Chapter 7, Section on Coaching Impact).

6.5.1 Positive CI Indicators

- Player IdeaRank improvement following coaching interventions
- Successful navigation of challenges after strategic guidance
- High plan adherence (player follows coached strategy effectively)

6.5.2 Negative CI Indicators

- Player IdeaRank decline after coaching intervention
- Confusion or misdirection following coach guidance
- Overcorrection leading to abandonment of effective strategies

6.6 Coach Development & Advancement

Coaches progress through their own ranking system based on sustained positive Coaching Impact:

Coach Certification Level	Requirements
Level 1 (Novice)	Complete coach training; 5+ matches
Level 2 (Certified)	Average CI $\geq +0.3$; 20+ matches
Level 3 (Master Coach)	Average CI $\geq +0.5$; 50+ matches; Class C eligible

Table 6.2: Coach Certification Levels

Chapter 7

Scoring — "The Measure of Thought"

7.1 The Principle of Measurement

Scoring in MetaSPN exists to make thought visible, fair, and comparable.

Core Principle

It's not about being right — it's about thinking well.

Every match is scored using **IdeaRank-Thought (IR-T)** — a unified algorithm derived from the six IdeaRank factors, expanded to include correctness, compliance, and coaching impact.

7.2 Structure of Scoring

Each round produces a composite score between **0.0** and **1.0**, computed as:

$$\text{IR-T} = O^{w_O} \times X^{w_X} \times U^{w_U} \times C^{w_C} \times L^{w_L} \times Q^{w_Q} \times T^{w_T} \times D^{w_D} \times (1 + \lambda \times \text{CI}) \tag{7.1}$$

7.2.1 Scoring Factors

The nine factors that comprise IdeaRank-Thought are defined as follows:

7.3 Weights & Class Modifiers

Each class emphasizes different aspects of cognitive performance, reflected in factor weight adjustments:

7.4 Coaching Impact (CI)

Coaching Impact measures the causal delta in player performance after coaching interventions:

$$\text{CI} = 0.6(\Delta\text{IR-T}) + 0.3(\text{plan adherence}) + 0.1(\text{challenge success}) \tag{7.2}$$

Symbol	Factor	Description
O	Outcome Validity	Correctness and robustness
X	Constraint Compliance	Adherence to rules, ethics, and resource limits
U	Uniqueness	Originality and creative problem framing
C	Cohesion	Logical and narrative consistency of reasoning
L	Learning	Progress, adaptation, and insight development
Q	Quality	Clarity, communicability, and polish
T	Trust	Verifiable grounding and testability
D	Density	Information efficiency and reasoning compactness
CI	Coach Impact	Measured influence of coaching interventions

Table 7.1: IdeaRank-Thought Scoring Factors

Class	Focus	Weight Adjustment	Coaching Mod (λ)
A (Developmental)	Growth, learning	+0.05 on **L**	$\lambda = 0.15$
B (Performance)	Execution & clarity	+0.05 on **Q**, **O**	$\lambda = 0.20$
C (Master)	Reflective & meta-coaching	+0.05 on **T**, **C**	$\lambda = 0.30$

Table 7.2: Class-Based Weight Modifiers

- **Positive CI** → Effective, timely guidance
- **Negative CI** → Detrimental or distracting coaching
- CI is capped at ±1.0

7.5 Rounds & Structure

Each match includes three rounds:

1. **Exploration** — Ideation
2. **Execution** — Problem Solving
3. **Reflection** — Justification

Timeouts and challenges are tracked; all reasoning steps are logged to the **MetaSPN Ledger** for auditability.

7.6 Ranking & Advancement

Player and Coach scores are averaged across matches to form **Meta Ratings (MR)**.

Promotions and class changes occur when MR thresholds are reached:

Transition	MR Threshold
A → B	≥ 650
B → C	≥ 800
Master Certification	≥ 950 and ≥ 10 verified matches

Table 7.3: Advancement Thresholds

Chapter 8

Integrity & Verification

MetaSPN maintains the highest standards of competitive integrity through comprehensive recording, verification, and transparency mechanisms.

8.1 The MetaSPN Ledger

All matches are recorded to the **MetaSPN Ledger**, a cryptographically secured, append-only log system.

8.1.1 Recorded Data

The Ledger captures:

- Complete reasoning traces (every step, decision, and calculation)
- All coaching communications (audio, text, or structured data)
- Timestamp data for all actions and timeouts
- IdeaRank factor scores at each evaluation point
- Participant declarations (AI model parameters, training data, etc.)
- Challenge and appeal records

8.1.2 Cryptographic Verification

Each match record receives:

- **Content hash** (SHA-256 or equivalent)
- **Digital signature** from authorized referee
- **Timestamp certification** from trusted time source
- **Merkle tree inclusion** for historical integrity

This ensures match records are:

- Immutable (cannot be altered retroactively)

- Auditable (complete history preserved)
- Verifiable (cryptographic proof of authenticity)

8.2 AI Participant Requirements

8.2.1 Model Fingerprinting

AI participants (players or coaches) undergo **model fingerprinting**:

1. **Challenge-response test** using standardized prompts
2. **Behavior profiling** on reference tasks
3. **Statistical signature analysis** of output patterns

This creates a unique identifier ensuring:

- The declared model matches the competing system
- No undisclosed modifications or external assistance
- Consistency across multiple matches

8.2.2 Reproducibility Checks

AI systems must demonstrate **reproducibility**:

- Given the same inputs and seed, produce identical outputs
- Replay matches for verification purposes
- Provide execution logs for audit

8.2.3 Data Access Controls

During matches, AI systems:

- **May not** access real-time internet data
- **May not** communicate with external systems
- **May** access declared knowledge bases (specified pre-match)
- **Must** operate in isolated execution environments

8.3 Ghost Replays

Ghost Replays are randomized post-match reruns used to ensure fairness and calibration.

8.3.1 Process

1. Random selection of completed matches (∼5% of all matches)
2. Human-only teams reattempt the same challenge
3. Scoring comparison identifies systematic biases
4. Adjustments made to IdeaRank calibration if needed

8.3.2 Purpose

- Verify scoring consistency across different participant types
- Detect challenge design flaws or ambiguities
- Calibrate IdeaRank weights based on expert human performance
- Build benchmark datasets for future AI development

8.4 Fair Play Enforcement

8.4.1 Prohibited Behaviors

The following constitute violations of MetaSPN integrity standards:

- **External assistance:** Accessing unauthorized resources or communication
- **Model deception:** Misrepresenting AI capabilities or training data
- **Coaching violations:** Providing direct solutions or unauthorized guidance
- **Score manipulation:** Attempting to game IdeaRank through artificial behaviors
- **Collusion:** Coordinating outcomes or sharing information across teams

8.4.2 Penalties

Violations result in:

Violation Severity	Penalty
Minor (unintentional)	Score deduction (-0.05 to -0.10)
Moderate (procedural breach)	Match disqualification
Severe (deliberate cheating)	Suspension (3–12 months)
Egregious (systemic fraud)	Permanent ban

Table 8.1: Integrity Violation Penalties

8.5 Appeals Process

8.5.1 Filing an Appeal

Participants may appeal:

- Scoring decisions
- Integrity violation rulings
- Referee errors or misconduct

Requirements:

- Filed within 24 hours of match completion
- Include specific claims with supporting evidence
- Submit to MetaSPN Council (see Chapter 10)

8.5.2 Appeal Review

Appeals are reviewed by a three-member panel:

- One technical expert (AI/scoring specialist)
- One competitive integrity officer
- One independent referee (not involved in original match)

Outcomes:

- Appeal upheld: Score adjusted, penalties reversed
- Appeal partially upheld: Modified ruling
- Appeal denied: Original decision stands

Decisions are final unless new evidence emerges.

8.6 Transparency Commitments

MetaSPN commits to:

- **Public rule documentation** (this rulebook)
- **Open scoring algorithms** (IdeaRank formula and weights)
- **Match data availability** (anonymized for research)
- **Governance meeting minutes** (published quarterly)
- **Annual integrity report** (violations, appeals, system improvements)

Chapter 9

Promotion & Advancement

MetaSPN participants advance through classes based on demonstrated performance and consistency, measured by the **Meta Rating (MR)** system.

9.1 Meta Rating (MR)

Meta Rating is a composite score reflecting both immediate performance and long-term consistency.

9.1.1 Player Meta Rating

$$\text{Player MR} = (\text{Avg. IRS} \times 100) + \text{Consistency Factor} \tag{9.1}$$

Where:

- **Avg. IRS** is the average IdeaRank Score across all completed matches
- **Consistency Factor** rewards stable performance (reduces penalty for outliers)

9.1.2 Coach Meta Rating

$$\text{Coach MR} = (\text{Player improvement rate} \times 0.8) + (\text{Match success} \times 0.2) \tag{9.2}$$

Where:

- **Player improvement rate** measures average increase in player IRS under coaching
- **Match success** reflects the absolute performance of coached players

9.2 Advancement Thresholds

Participants advance between classes upon reaching MR thresholds:

Transition	MR Threshold	Additional Requirements
Class A → B	≥ 650	10+ matches in Class A
Class B → C	≥ 800	15+ matches in Class B
Master Certification	≥ 950	≥ 10 verified matches in Class C

Table 9.1: Class Advancement Requirements

9.3 Advancement Process

9.3.1 Eligibility Review

When a participant reaches an advancement threshold:

1. **Automatic notification** sent to participant and coach
2. **Performance review** by Advancement Committee (3–5 business days)
3. **Verification** of match data integrity and eligibility criteria
4. **Advancement confirmation** or feedback on remaining gaps

9.3.2 Provisional Advancement

Newly advanced participants enter their new class with **provisional status**:

- First 5 matches are monitored closely
- If MR drops below threshold (−50 MR), may be returned to previous class
- After 5 successful matches, status becomes permanent

9.4 Demotion

Participants may be demoted if:

- MR falls below class threshold by ≥ 100 points
- Sustained poor performance over 20+ consecutive matches
- Request voluntary demotion (e.g., for coaching development purposes)

Demotion is not punitive—it ensures appropriate challenge level and continued growth.

9.5 Master Certification

Master Certification represents the pinnacle of MetaSPN achievement.

9.5.1 Requirements

- Meta Rating ≥ 950
- Minimum 10 verified matches in Class C
- Demonstrated expertise across all three round types (Exploration, Execution, Reflection)
- Positive Coaching Impact when coaching others (applicable to both players and coaches)

9.5.2 Benefits

Master-certified participants gain:

- **Challenge design privileges** (propose new games for league use)
- **Referee certification** eligibility
- **Governance participation** (eligibility for Council membership)
- **Priority matching** in Special Division exhibitions
- **Public Master Registry** listing with achievement highlights

9.6 Specialized Tracks

Advanced participants may pursue specialized tracks:

9.6.1 Coaching Specialist

Focus on coach development and meta-coaching:

- Train other coaches
- Develop coaching systems and methodologies
- High CI scores across diverse player types

9.6.2 Challenge Designer

Focus on creating new games and formats:

- Design cognitive challenges
- Calibrate difficulty and IdeaRank alignment
- Contribute to league game library

9.6.3 Referee

Focus on officiating and integrity enforcement:

- Complete referee training and certification
- Officiate matches with high accuracy
- Participate in appeal reviews

9.6.4 Researcher

Focus on cognitive science and AI development:

- Analyze MetaSPN data for insights
- Publish research using league data
- Contribute to IdeaRank refinement

9.7 Rank Display & Recognition

Participant rankings are displayed on:

- **Public leaderboards** (by class and division)
- **Participant profiles** (match history, MR trajectory)
- **Achievement badges** (milestones, specializations)

Rankings update weekly based on recent match performance.

Chapter 10

League Governance

MetaSPN is governed by a multi-stakeholder system designed to ensure fairness, transparency, and continuous improvement.

10.1 Governance Structure

Three primary bodies oversee MetaSPN operations:

10.1.1 The MetaSPN Council

Composition:

- 7 members: 3 Master-certified participants, 2 technical experts, 2 community representatives
- 2-year rotating terms (staggered for continuity)

Responsibilities:

- Rule interpretation and clarification
- Appeal adjudication (final authority)
- Policy updates and governance reforms
- Strategic direction and league development

Decision-making:

- Majority vote (4 of 7) for standard decisions
- Supermajority (5 of 7) for rule changes affecting scoring or advancement
- Public meeting minutes published quarterly

10.1.2 The IdeaRank Oversight Committee (IROC)

Composition:

- 5 members: psychometricians, AI researchers, cognitive scientists, statisticians
- Subject matter experts in measurement and assessment

Responsibilities:

- Maintain and calibrate IdeaRank formula
- Analyze scoring data for bias or inconsistency
- Propose weight adjustments based on empirical analysis
- Validate new scoring factors or modifications

Process:

- Quarterly reviews of scoring performance
- Annual calibration using Ghost Replay data
- Public reporting of methodology changes

10.1.3 The Ethics & Integrity Board

Composition:

- 5 members: ethicists, legal experts, integrity officers, diverse stakeholder representatives

Responsibilities:

- Oversee fair play and conduct enforcement
- Review AI transparency compliance
- Investigate integrity violations and misconduct
- Develop ethical guidelines for emerging technologies

Authority:

- Issue penalties for violations (subject to appeal to Council)
- Mandate corrective actions for participants or systems
- Recommend policy changes to Council

10.2 Rule Amendment Process

10.2.1 Proposal

Rule amendments may be proposed by:

- MetaSPN Council members
- IROC or Ethics & Integrity Board
- Petition from ≥ 100 Master-certified participants

10.2.2 Review Period

1. **Public comment period** (30 days)
2. **Technical review** by relevant committee(s)
3. **Impact assessment** on existing participants and matches

10.2.3 Adoption

- Council votes on amendment (supermajority required for scoring/advancement changes)
- If approved, amendment enters **provisional status** for one season
- After successful provisional period, becomes permanent rule

10.3 Conflict Resolution

10.3.1 Participant Disputes

Disputes between participants (coaching conflicts, conduct issues, etc.) are handled through:

1. **Mediation** by neutral referee or Council representative
2. **Formal hearing** if mediation fails (Ethics & Integrity Board)
3. **Final appeal** to full MetaSPN Council

10.3.2 Technical Disputes

Disputes regarding scoring, AI systems, or technical violations:

1. **Technical review** by IROC or designated expert panel
2. **Evidence presentation** by disputing parties
3. **Binding decision** with detailed rationale

10.4 Community Participation

10.4.1 Town Halls

MetaSPN holds quarterly **Town Hall meetings** where:

- Council reports on league status and developments
- Participants provide feedback and suggestions
- Upcoming rule changes are previewed
- Community concerns are addressed

10.4.2 Advisory Groups

Specialized advisory groups may be formed to address:

- New challenge development
- AI regulation and transparency standards
- Educational program design
- Spectator experience improvement

10.4.3 Open Data Initiative

MetaSPN publishes (with privacy protections):

- Anonymized match data for research
- Aggregate statistics on scoring and performance
- IdeaRank calibration methodology
- Governance meeting minutes and decisions

10.5 Governance Principles

MetaSPN governance operates according to these principles:

1. **Transparency:** All decisions and processes publicly documented
2. **Accountability:** Clear responsibility for all governance functions
3. **Inclusivity:** Diverse representation across governance bodies
4. **Evidence-based:** Decisions grounded in data and research
5. **Continuous improvement:** Regular review and refinement of systems
6. **Community-driven:** Participant input valued and integrated

10.6 Amendments to Governance

The governance structure itself may be amended through:

- Council supermajority vote (6 of 7)
- Community referendum (with $\geq 60\%$ approval from Master-certified participants)
- Annual governance review process

Major governance reforms require both Council approval and community referendum.

Chapter 11

Spectator & Media Rules

MetaSPN is designed as a *spectator sport*—cognitive competition made visible, engaging, and educational for audiences.

11.1 Broadcast Standards

All public matches are broadcast with comprehensive visualization and commentary systems.

11.1.1 Reason Map Overlay

The **Reason Map Overlay** is the primary visualization tool for live matches, displaying:

- **Reasoning graph:** Node-link diagram showing thought progression
- **Decision points:** Key choices and alternative paths considered
- **Constraint status:** Resource usage, time remaining, rule compliance
- **IdeaRank factors:** Real-time factor scores with historical comparison
- **Coaching interventions:** Highlighted timeout communications

11.1.2 Multi-Layer View Options

Spectators can choose viewing modes:

11.2 Live Commentary

11.2.1 Official Commentators

MetaSPN matches feature expert commentary from:

- **Play-by-play commentators:** Narrate reasoning steps and match flow
- **Analyst commentators:** Explain strategic choices and cognitive techniques
- **Technical experts:** Interpret AI behavior and advanced methods

View Mode	Description
Standard	Default view with Reason Map Overlay and basic statistics
Expert	Detailed factor breakdowns, prediction models, comparative analytics
Educational	Simplified explanations, cognitive science commentary, learning highlights
Immersive	First-person player perspective with minimal UI
Coach Cam	Focus on coaching decisions and strategic interventions

Table 11.1: Spectator Viewing Modes

11.2.2 Coach Microphones

During timeouts and briefings:

- Coaches are microphone-equipped
- All communication is live-broadcast with minimal delay
- Transcription provided for accessibility

11.3 Audience Interaction

11.3.1 Audience Solve Mode

Spectators may participate in **Audience Solve Mode**:

- Viewers attempt the same challenge as competitors
- Submissions scored using IdeaRank (unofficial "shadow scores")
- Top audience performers recognized on leaderboards
- Educational feedback provided post-match

Purpose:

- Engage spectators actively rather than passively
- Provide learning opportunities
- Build community of cognitive sport enthusiasts

11.3.2 Live Polls & Predictions

Spectators can:

- Vote on predicted strategies or outcomes
- Answer trivia related to match challenges
- Rate player and coach performance (informal feedback)

11.3.3 Chat & Community Features

Match broadcasts include:

- Live chat channels (moderated)
- Expert Q&A sessions during intermissions
- Post-match discussion forums

11.4 Media Access

11.4.1 Recording & Archiving

All public matches are:

- Recorded in full (video, audio, data streams)
- Archived permanently in MetaSPN media library
- Available for on-demand viewing
- Annotated with timestamps and key moment highlights

11.4.2 Highlight & Analysis Content

Post-match content includes:

- **Highlight reels:** Best reasoning moments, dramatic timeouts, comebacks
- **Strategy breakdowns:** Deep dives into coaching decisions
- **Player interviews:** Reflection on performance and learning
- **Educational series:** Tutorials based on match techniques

11.4.3 Third-Party Media

External media organizations may:

- Apply for press credentials
- Create derivative content (subject to licensing)
- Conduct interviews with participants (with consent)
- Access match data APIs for analysis and storytelling

11.5 Privacy & Consent

11.5.1 Participant Privacy

- Participants consent to broadcast when entering public matches
- Private training matches available (not broadcast)
- Personal data protected; only performance data made public

11.5.2 Spectator Privacy

- Audience Solve Mode participation is pseudonymous
- Chat and community features follow standard privacy policies
- Personal data not shared with third parties without consent

11.6 Accessibility

MetaSPN commits to accessible broadcasting:

- **Closed captioning** for all audio content
- **Audio description** tracks for visually impaired viewers
- **High-contrast and colorblind-friendly** visualization modes
- **Keyboard navigation** for all interactive features
- **Multi-language support** for commentary and interface

11.7 Sponsorship & Advertising

11.7.1 Permitted Advertising

- Non-intrusive sponsorship placements (logos, banners)
- Pre-match and intermission advertising
- Sponsored match series or tournaments

11.7.2 Prohibited Advertising

- Overlay ads that obscure Reason Map or critical information
- Advertising for products/services that undermine integrity (e.g., "AI cheating tools")
- Mid-round interruptions

11.8 Community Events

MetaSPN hosts regular community events:

- **Exhibition matches:** Featuring novel formats or celebrity participants
- **Championship series:** Season-ending tournaments with top performers
- **Educational workshops:** Live training sessions with Master coaches
- **Challenge design contests:** Community-created games tested in matches

Chapter 12

Future Addenda

MetaSPN is designed to evolve. This chapter outlines planned expansions and experimental directions for the league.

12.1 Planned Expansions

12.1.1 Division D: Collaborative AI/AI with Human Referee

Concept:

- Multiple AI agents collaborate on complex challenges
- Human referee coordinates and evaluates coordination
- Focus on multi-agent cooperation and emergent behavior

Target Launch: Year 2
Key Questions to Explore:

- How do AI systems negotiate roles and strategy?
- What communication protocols emerge naturally?
- How does human oversight enhance AI collaboration?

12.1.2 Division E: Asynchronous Play

Concept:

- Matches streamed over extended time periods (days/weeks)
- Participants engage in multiple rounds at their own pace
- Emphasis on depth, research, and iterative refinement

Target Launch: Year 2
Use Cases:

- Grand strategy challenges
- Research-intensive problems
- Longitudinal learning assessment

12.1.3 Educational Circuits

Concept:

- High school and university-tier MetaSPN leagues
- Curriculum-aligned challenges
- Integration with educational standards and assessments

Target Launch: Year 3
Goals:

- Develop cognitive sport skills in students
- Create talent pipeline for professional MetaSPN
- Provide teachers with assessment and engagement tools

12.1.4 "Meta Coach Level 1–3" Accreditation Program

Concept:

- Formal certification program for coaches
- Structured curriculum covering cognitive coaching techniques
- Practical apprenticeship with experienced Master coaches

Target Launch: Year 1 (pilot program)
Certification Levels:

- **Level 1 (Novice Coach):** Basic coaching principles, Class A eligibility
- **Level 2 (Certified Coach):** Advanced techniques, Class B eligibility
- **Level 3 (Master Coach):** Meta-coaching, Class C eligibility, coach trainer status

12.2 Experimental Formats

12.2.1 Team Competitions

Concept:

- 3–5 person teams tackle complex challenges
- Scoring includes collaboration factors (communication, division of labor, synthesis)
- Coaches manage team dynamics and strategy

12.2.2 Cross-Domain Challenges

Concept:

- Challenges requiring expertise across multiple domains
- Tests knowledge transfer and analogical reasoning
- Encourages interdisciplinary thinking

12.2.3 Adaptive Difficulty

Concept:

- Challenge difficulty adjusts in real-time based on performance
- Keeps participants in optimal "flow state"
- Tests adaptive capacity and resilience

12.2.4 Mixed Reality Integration

Concept:

- Incorporate AR/VR elements for spatial reasoning tasks
- Physical manipulation combined with cognitive challenge
- Hybrid cognitive-physical sport

12.3 Research Initiatives

12.3.1 Cognitive Science Partnerships

MetaSPN will partner with academic institutions to:

- Study reasoning patterns and cognitive strategies
- Validate IdeaRank as a psychometric tool
- Investigate human-AI collaboration dynamics
- Develop new theories of competitive cognition

12.3.2 AI Safety & Alignment Research

MetaSPN data provides opportunities to study:

- AI transparency and interpretability in real-world tasks
- Human oversight and guidance of AI systems
- Emergent behaviors in competitive environments
- Benchmarking AI reasoning capabilities

12.3.3 Educational Assessment Innovation

Explore MetaSPN as:

- Alternative to traditional standardized testing
- Formative assessment tool for skill development
- Measure of "21st-century skills" (critical thinking, creativity, collaboration)

12.4 Technology Roadmap

12.4.1 Platform Enhancements

Year 1:

- Enhanced Reason Map visualizations
- Mobile viewing apps
- Improved spectator interaction tools

Year 2:

- VR spectator mode
- Advanced analytics dashboard for participants
- Automated highlight generation using AI

Year 3:

- Fully decentralized MetaSPN Ledger (blockchain integration)
- AI-powered personalized learning recommendations
- Global tournament infrastructure

12.4.2 Scoring Refinements

Ongoing development of IdeaRank to:

- Incorporate additional cognitive factors (e.g., collaboration, creativity)
- Improve calibration through machine learning
- Develop domain-specific scoring profiles

12.5 Community Growth

12.5.1 Global Expansion

Goals:

- Establish regional leagues in 10+ countries by Year 3
- Multi-language support for all platform features
- Cultural adaptation of challenges and formats

12.5.2 Amateur & Professional Tiers

Vision:

- **Amateur tier:** Free participation, community-driven
- **Professional tier:** Sponsored competitions with prize pools
- Pathways for advancement from amateur to professional

12.5.3 Corporate & Enterprise Programs

Applications:

- Team-building and professional development
- Hiring and assessment (cognitive skills evaluation)
- Innovation workshops using MetaSPN frameworks

12.6 Feedback & Iteration

MetaSPN is committed to continuous improvement through:

- **Regular participant surveys**
- **Data-driven analysis** of match outcomes and scoring
- **Community advisory groups** for proposed changes
- **Annual "State of MetaSPN" reports** detailing progress and goals

This chapter will be updated annually as MetaSPN evolves.

Appendix A

Technical Appendix — "The Anatomy of IdeaRank-Thought"

This appendix provides the computational and implementation details underlying the IdeaRank-Thought scoring system.

A.1 A1. Factor Computation Details

Each IdeaRank factor is derived from specific data sources using validated computational methods:

Factor	Source Data	Computational Method
U (Uniqueness)	Graph similarity vs league corpus	Novelty z-score → sigmoid normalization
C (Cohesion)	Reasoning map analysis	Structural consistency, linguistic coherence
L (Learning)	Early/late checkpoint delta	Skill gain function over time
Q (Quality)	Human & AI rubric	Readability, completeness, clarity metrics
T (Trust)	Test logs, citations	Pass rate × citation quality
D (Density)	Tokens vs valid nodes	Information-per-step compression ratio

Table A.1: Factor Computation Methods

A.2 A2. Gate Formulas

The foundational factors use specific gating functions to ensure score validity:

A.2.1 Outcome Validity (O)

$$O = 0.7 \times \text{correctness} + 0.3 \times \text{robustness} \tag{A.1}$$

Where:

- **Correctness** measures solution accuracy against ground truth or expert evaluation

- **Robustness** assesses stability under variation and edge case handling

A.2.2 Constraint Compliance (X)

$$X = 1 - \text{violation\_penalty} \tag{A.2}$$

Where:

- **Violation penalty** accumulates for each rule, resource, or ethical constraint breach
- Penalties are proportional to severity and frequency
- $X = 1$ indicates perfect compliance

A.3 A3. Coaching Signal Processing

All coaching events are timestamped and cross-referenced with reasoning improvement metrics.

A.3.1 Timeout Delta Measurement

Coaching effectiveness is measured over **3 checkpoints**:

1. **Pre-timeout:** Player performance immediately before coaching intervention
2. **During-timeout:** Coaching communication content and structure
3. **Post-timeout:** Player performance in subsequent reasoning steps

The delta is computed as:

$$\Delta\text{IR-T} = \text{IR-T}_{\text{post}} - \text{IR-T}_{\text{pre}} \tag{A.3}$$

A.3.2 Plan Adherence Calculation

Plan adherence measures alignment between coached strategy and actual execution:

$$\text{Plan Adherence} = \text{semantic\_similarity}(\text{prebrief\_plan}, \text{executed\_reasoning}) \tag{A.4}$$

Computed using:

- Vector embeddings of plan and execution traces
- Cosine similarity or earth mover's distance
- Normalized to [0, 1] scale

A.4 A4. Integrity Protocols

A.4.1 Ledger Hashing

Every match's reasoning data is stored as an immutable hash for verification:

- **Hash function:** SHA-256 or equivalent cryptographic standard
- **Merkle tree structure:** Enables efficient partial verification
- **Timestamping:** RFC 3161 compliant trusted timestamps

A.4.2 Replay Validation

AI models and human replays are cross-run for reproducibility:

- **Deterministic execution:** Fixed random seeds, controlled environments
- **Bit-level comparison:** Output verification for AI systems
- **Human replay protocols:** Ghost replays using identical challenges

A.4.3 Anti-Gaming Measures

Multiplicative scoring punishes over-optimization of single factors:

- Factor multiplication (rather than addition) prevents single-factor dominance
- Balanced performance across factors yields higher overall scores
- Extreme specialization results in score penalties

A.5 A5. Output Metrics

Each match produces a comprehensive set of performance metrics:

IR-T Raw Score (0–1)
The unmodified IdeaRank-Thought score as computed by the base formula.

IR-T Class Adjusted Score
Raw score with class-specific weight adjustments applied (see Chapter 7, Section on Weights & Class Modifiers).

Coach Impact Index (CI)
Measured coaching effectiveness: CI $\in [-1.0, +1.0]$

Meta Rating (MR)
Long-term performance composite used for advancement decisions.

Entropy Index (EI) for Tiebreaks
Reasoning tree efficiency measure: lower entropy indicates more direct paths to solution.

$$\mathrm{EI} = -\sum_i p_i \log_2(p_i) \tag{A.5}$$

where p_i represents the probability distribution over reasoning branches explored.

A.6 A6. Visualization Schema

Reason Map Overlays employ a multi-dimensional encoding system for real-time match visualization:

A.6.1 Visual Encoding

- **Node color** → Factor weight contribution
  - Hue indicates dominant factor (e.g., blue = Cohesion, green = Learning)
  - Saturation indicates contribution magnitude
- **Edge thickness** → Cohesion strength
  - Thicker edges represent stronger logical connections
  - Dashed edges indicate tentative or exploratory reasoning
- **Halo glow** → Coaching intervention zones
  - Glowing nodes indicate post-timeout reasoning
  - Glow intensity correlates with coaching impact magnitude

A.6.2 Interactive Features

Spectators can interact with Reason Maps to:

- Isolate individual factor contributions
- Replay reasoning sequences at variable speed
- Compare alternative paths not taken
- View detailed factor breakdowns per node

A.7 A7. Open Science Clause

MetaSPN operates under principles of transparency and reproducibility:

A.7.1 Open Standards

All algorithms, rubrics, and evaluation criteria are **open standard** under the MetaSPN Charter:

- Complete algorithm specifications publicly documented
- Reference implementations available in open-source repositories
- Validation datasets provided for calibration and testing

A.7.2 Auditability

Any team can audit or replicate scoring through the **open IdeaRank SDK**:

- **Python SDK:** `pip install metaspn-idearank`
- **JavaScript SDK:** `npm install @metaspn/idearank`
- **REST API:** Public endpoints for score computation and validation

A.7.3 Research Access

Academic and commercial researchers may access:

- Anonymized match data for analysis
- Historical scoring calibration data
- Participant consent for case studies
- Computational resources for replication studies

Technical specifications are maintained and updated by IROC (IdeaRank Oversight Committee).
For the latest technical documentation, visit: https://docs.metaspn.org/technical

Appendix B

Glossary of Terms

Core Concepts

Challenge
A cognitive task or problem presented to participants during a match round.

Class
Skill tier within MetaSPN (A: Developmental, B: Performance, C: Master), determining coaching intensity and scoring weights.

Coach
A meta-agent (human or AI) that guides player strategy, decision-making, and development.

Coaching Impact (CI)
Measured influence of coaching interventions on player performance, calculated as causal delta in IdeaRank score.

Division
Match format defined by player-coach pairing type (e.g., Division 1: Human player, AI coach).

Ghost Replay
Post-match reruns conducted by human teams to verify scoring consistency and calibrate IdeaRank.

IdeaRank (IR)
The foundational algorithm for measuring thought quality across six factors: Originality, Execution, Uniqueness, Cohesion, Learning, and Quality.

IdeaRank-Thought (IR-T)
Extended scoring algorithm incorporating nine factors including correctness, compliance, and coaching impact.

Meta Rating (MR)
Composite score reflecting participant performance and consistency across matches, used for advancement decisions.

MetaSPN Council
Primary governance body responsible for rule interpretation, appeals, and strategic direction.

MetaSPN Ledger
Cryptographically secured, append-only log system recording all match data for verification and auditability.

Player
The primary participant executing reasoning tasks during a match (may be human or AI).

Reason Integrity Penalty
Score deduction applied for coaching violations or rule infractions.

Reason Map Overlay
Real-time visualization system displaying reasoning graphs, decision points, and IdeaRank factors for spectators.

Referee
Official who oversees match conduct, enforces rules, and makes real-time rulings.

Round
One of three structured segments within a match: Exploration, Execution, or Reflection.

Timeout
Designated period when coaches may communicate with players; duration and quantity vary by class.

Scoring Factors

Outcome Validity (O)
Correctness and robustness of solutions or conclusions.

Constraint Compliance (X)
Adherence to rules, ethical guidelines, and resource limits.

Uniqueness (U)
Originality and creative problem framing.

Cohesion (C)
Logical and narrative consistency of reasoning.

Learning (L)
Progress, adaptation, and insight development during the match.

Quality (Q)
Clarity, communicability, and polish of presented reasoning.

Trust (T)
Verifiable grounding and testability of claims and reasoning.

Density (D)
Information efficiency and reasoning compactness.

Organizational Terms

Advancement Committee
Subgroup responsible for reviewing participant eligibility for class promotion.

Ethics & Integrity Board
Governance body overseeing fair play, AI transparency, and conduct enforcement.

IdeaRank Oversight Committee (IROC)
Technical body responsible for maintaining and calibrating the IdeaRank scoring algorithm.

Master Certification
Highest achievement level in MetaSPN (MR $\geq$ 950, 10+ Class C matches), granting governance and design privileges.

Model Fingerprinting
Process of uniquely identifying AI systems through challenge-response testing and behavioral profiling.

Match Types & Formats

Audience Solve Mode
Interactive feature allowing spectators to attempt match challenges and receive unofficial IdeaRank scores.

Cross-Division Tournament
Special competition where different pairing types (Divisions 1-3) compete on identical challenges.

Exhibition Match
Non-ranked match featuring experimental formats, celebrity participants, or showcase performances.

Provisional Status
Temporary classification for newly advanced participants (first 5 matches in new class).

Reflective Timeout
Special timeout type (Class C only) used for post-round meta-analysis rather than in-round guidance.

Special Division
Experimental format featuring AI player and AI coach with human commentary.

Acronyms

CI
Coaching Impact

IR
IdeaRank

IROC
IdeaRank Oversight Committee

IRS
IdeaRank Score

IR-T
IdeaRank-Thought

MR
Meta Rating

"Think visibly. Compete intelligently. Evolve together."

— MetaSPN League Charter