AutoPool.BET: Competitive Strategy Betting Protocol V2.0

Revolutionary Multi-Chain AI-Powered Strategy Competition Platform

Version: 2.0

Date: June 2025

Classification: Technical Whitepaper

Network: Avalanche Native + Cross-Chain Integration

Executive Summary

AutoPool.BET represents a paradigm shift in decentralized prediction markets by introducing **competitive pool creation** where pool creators become active participants, competing alongside other strategists in AI-evaluated strategy competitions. This revolutionary approach eliminates the traditional house-edge model, creating a truly peer-to-peer strategic betting environment.

Key Innovations:

- **Creator-as-Competitor Model**: Pool creators participate as players, not just infrastructure providers
- **Confidence-Weighted Rewards**: Investment amount reflects strategy confidence, amplifying skilled predictions
- **Hybrid Cross-Chain Architecture**: Native Avalanche ICM/ICTT + External CCIP integration
- **AI-Driven Performance Evaluation**: Multi-dimensional strategy scoring with mathematical confidence intervals
- **Dynamic AMM Mechanics**: Uniswap V2-based pools with adaptive fee structures

---

Deployed Smart Contract Infrastructure

Core Protocol Contracts (Avalanche Fuji Testnet)

Contract	Address	Purpose	Status
BETmain Token	`0x027dc7eAaE39Ea643e48523036AFec75eAdE6905`	Universal base token with dynamic supply	Production Ready
Enhanced Competition Factory	`0xD48fAdd18f2536a0193F036d85383DA3f92E8f3D`	Main competition pool creation & management	Production Ready
Prize Oracle	`0x703F8d9f3e31c8D572b3e6497d503cC494E467E5`	AI strategy evaluation & reward calculation	Production Ready
Competition Factory (Legacy)	`0x53BA3e2AED1f8a5C3fe7B3026C07B83AD24c31f5`	Original implementation (deprecated)	Legacy Support

Cross-Chain Bridge Infrastructure

Network	Contract	Address	Protocol	Purpose
Avalanche Fuji	Avalanche CCIP Bridge	`0xf416d0e2670d4016B42188a9070f2d8c9B2A60ad`	Chainlink CCIP	External chain bridging
Avalanche Fuji	Teleporter Bridge	`0x93D195bb10FeC9E2A67BAd7D5d3aeE4682A04F7A`	Native ICM/ICTT	Avalanche interchain messaging
Ethereum Sepolia	CCIP Gateway	`0x26cF4022AC4e15405CFBfd45566F0DEdC80d74d4`	Chainlink CCIP	External entry point

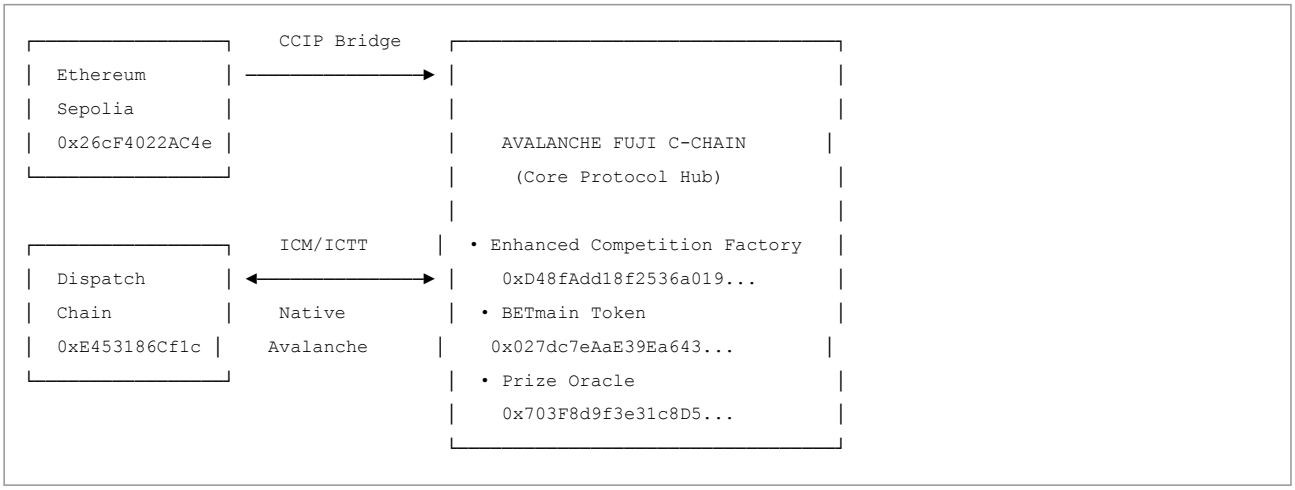
Network	Contract	Address	Protocol	Purpose
Ethereum Sepolia	Sepolia Participation	`0x0c52d6EbEb3d815fcF3eccf09522028ed787f74a`	CCIP Integration	Cross-chain participation
Dispatch L1	Dispatch Participation	`0xE453186Cf1cdb56D3784523655aAA95a66db35e8`	Native Teleporter	Real interchain execution

1. Protocol Architecture

1.1 Core Components

Component	Description	Location	Innovation
BETmain	Universal base token	Avalanche Fuji C-Chain	Dynamic supply, cross-chain native
BET	Strategy-specific competition tokens	Multi-chain deployment	Temporary lifecycle, burn-after-settlement
CompetitionAMM	Enhanced AMM pools	Avalanche native	Creator participation integration
StrategyAI	Advanced AI evaluation engine	Distributed compute	Confidence interval scoring
CrossChainBridge	Hybrid ICM/CCIP gateway	Multi-protocol	Native + external chain support

1.2 Multi-Chain Integration Strategy



2. Creator-as-Competitor Model

2.1 Revolutionary Pool Creation Mechanism

Traditional prediction markets suffer from centralized house-edge models. AutoPool.BET eliminates this by making **pool creators active participants** who must compete with their own strategies.

Pool Creation Flow:

1. **Creator Investment**: Provides initial liquidity (e.g., 100 BETmain)
2. **Strategy Submission**: Creator submits their own trading strategy
3. **Pool Deployment**: Creates BET tokens and AMM pair
4. **Open Competition**: Other players join with their strategies
5. **Fair Settlement**: Creator competes on equal terms

2.2 Smart Contract Implementation

```
// Enhanced Competition Factory: 0xD48fAdd18f2536a0193F036d85383DA3f92E8f3D
contract EnhancedCompetitionFactory {
    struct Competition {
        uint256 id;
        address creator;
        string title;
        uint256 createdAt;
        uint256 totalPool;
        uint256 participantCount;
        bool isClosed;
        bool isSettled;
    }

    struct Participant {
        address participant;
        uint256 investment;
        uint256 confidence;
        uint256 aiScore;
        bool hasPaidOut;
    }

    mapping(uint256 => Competition) public competitions;
    mapping(uint256 => mapping(address => Participant)) public participants;

    function createCompetition(
        uint256 competitionId,
        string memory title,
        uint256 investment,
        uint256 confidence
    ) external {
        require(investment >= minimumInvestment, "InsufficientInvestment");
        require(confidence >= 1 && confidence <= 100, "InvalidConfidence");

        // Creator becomes first participant
        competitions[competitionId] = Competition({
            id: competitionId,
            creator: msg.sender,
            title: title,
            createdAt: block.timestamp,
            totalPool: investment,
            participantCount: 1,
            isClosed: false,
            isSettled: false
        });

        participants[competitionId][msg.sender] = Participant({
            participant: msg.sender,
            investment: investment,
            confidence: confidence,
            aiScore: 0, // To be set by oracle
            hasPaidOut: false
        });

        // Transfer tokens from creator
        betmainToken.transferFrom(msg.sender, address(this), investment);
```

```
        emit CompetitionCreated(competitionId, msg.sender, title, investment, confidence);
    }
}
```

2.3 Economic Incentive Alignment

```
// Prize Oracle: 0x703F8d9f3e31c8D572b3e6497d503cC494E467E5
function calculateCreatorReward(uint256 competitionId, address creator)
    external view returns (uint256 totalReward) {

    Competition memory comp = competitions[competitionId];
    Participant memory creatorData = participants[competitionId][creator];

    uint256 infrastructureFee = comp.totalPool * 5 / 100;  // Fixed 5%
    uint256 confidenceWeight = creatorData.investment * creatorData.aiScore / 100;
    uint256 totalConfidenceWeight = getTotalConfidenceWeight(competitionId);

    uint256 competitionReward = (confidenceWeight * (comp.totalPool - infrastructureFee))
                              / totalConfidenceWeight;

    return infrastructureFee + competitionReward;
}
```

---

3. Confidence-Weighted Reward Mathematics

3.1 The Confidence Factor Innovation

Traditional betting systems only consider prediction accuracy. AutoPool.BET introduces **investment amount as confidence signal**, creating a sophisticated risk-reward matrix.

Mathematical Foundation:

Confidence Weight (CW) = Investment Amount × AI Performance Score

Individual Reward = (Player CW / Total CW) × Competition Pool

3.2 Detailed Reward Calculation Example

Competition Setup:

- Pool Creator: 100 BETmain investment, 0.5 AI score
- Player A: 10 BETmain investment, 0.8 AI score (#1 leaderboard)
- Player B: 20 BETmain investment, 0.7 AI score (#2 leaderboard)
- Player C: 15 BETmain investment, 0.6 AI score (#3 leaderboard)

Step 1: Calculate Confidence Weights

```
Creator CW = 100 × 0.5 = 50.0
Player A CW = 10 × 0.8 = 8.0
Player B CW = 20 × 0.7 = 14.0
Player C CW = 15 × 0.6 = 9.0
Total CW = 81.0
```

Step 2: Distribute Rewards

```
Total Pool = 145 BETmain
Infrastructure Fee = 145 × 0.05 = 7.25 BETmain (to creator)
Competition Pool = 137.75 BETmain

Creator Reward = (50.0/81.0) × 137.75 + 7.25 = 92.2 BETmain
Player A Reward = (8.0/81.0) × 137.75 = 13.6 BETmain
Player B Reward = (14.0/81.0) × 137.75 = 23.8 BETmain
Player C Reward = (9.0/81.0) × 137.75 = 15.3 BETmain
```

Outcome Analysis:

- **Player A**: Highest skill (0.8) but low confidence (10 investment) = moderate profit (+3.6)
- **Player B**: Good skill (0.7) + medium confidence (20 investment) = good profit (+3.8)
- **Creator**: Low skill (0.5) despite high confidence (100 investment) = loss (-7.8)

---

4. Cross-Chain Integration Architecture

4.1 Hybrid Bridge Protocol

AutoPool.BET implements a sophisticated dual-bridge system:

Native Avalanche Chains (Fuji ↔ Dispatch):

- **Interchain Messaging (ICM)**: Strategy submission and result distribution
- **Interchain Token Transfer (ICTT)**: BETmain and BET token movement
- **Contract**: Teleporter Bridge `0x93D195bb10FeC9E2A67BAd7D5d3aeE4682A04F7A`
- **Cost**: ~$0.01-0.05 per transaction
- **Speed**: 2-5 seconds finality

External Chains (Sepolia → Fuji):

- **Chainlink CCIP**: Asset bridging for external participants
- **Contract**: CCIP Gateway `0x26cF4022AC4e15405CFBfd45566F0DEdC80d74d4`
- **Cost**: ~$3-5 per cross-chain transaction
- **Speed**: 10-20 minutes settlement

4.2 Cross-Chain Participation Implementation

Sepolia CCIP Integration

```
// Sepolia Participation: 0x0c52d6EbEb3d815fcF3eccf09522028ed787f74a
contract SepoliaParticipation {
    function joinCompetitionWithETH(
        uint256 competitionId,
        uint256 confidence
    ) external payable {
        require(msg.value >= minimumEthAmount, "InsufficientETHAmount");
        require(confidence >= 1 && confidence <= 100, "InvalidConfidence");

        uint256 ccipFee = calculateCCIPFee(msg.value);
        uint256 actualParticipation = msg.value - ccipFee;

        // Send cross-chain message to Avalanche
        bytes memory message = abi.encode(
            msg.sender,
            competitionId,
            actualParticipation,
            confidence,
            "Ethereum Sepolia"
        );

        bytes32 messageId = router.ccipSend(
            avalancheChainSelector,
            Client.EVM2AnyMessage({
                receiver: abi.encode(avalancheCompetitionFactory),
                data: message,
                tokenAmounts: new Client.EVMTokenAmount[](0),
                extraArgs: "",
                feeToken: address(0)
            })
        );

        emit CrossChainParticipationSent(
            msg.sender,
            competitionId,
            msg.value,
            actualParticipation * ETH_TO_BETMAIN_RATE,
            confidence,
            messageId
        );
    }
}
```

Dispatch Native Integration

```
// Dispatch Participation: 0xE453186Cf1cdb56D3784523655aAA95a66db35e8
contract DispatchParticipation {
    function joinCompetitionWithAVAX(
        uint256 competitionId,
        uint256 confidence
    ) external payable {
        require(msg.value >= minimumAvaxAmount, "InsufficientAVAXAmount");
        require(confidence >= 1 && confidence <= 100, "InvalidConfidence");

        (uint256 totalCost, uint256 teleporterFee, uint256 actualParticipation) =
            getParticipationCost(msg.value);

        // Real Teleporter message to Avalanche Fuji
        bytes memory message = abi.encode(
            msg.sender,
            competitionId,
            actualParticipation,
            confidence,
            "Dispatch L1"
        );

        bytes32 messageId = teleporterMessenger.sendCrossChainMessage(
            TeleporterMessageInput({
                destinationBlockchainID: AVALANCHE_FUJI_BLOCKCHAIN_ID,
                destinationAddress: avalancheBridgeContract,
                feeInfo: TeleporterFeeInfo({
                    feeTokenAddress: address(0),
                    amount: teleporterFee
                }),
                requiredGasLimit: teleporterGasLimit,
                allowedRelayerAddresses: new address[](0),
                message: message
            })
        );

        totalParticipations++;
        totalAvaxSent += actualParticipation;
        userParticipations[msg.sender]++;

        emit CrossChainParticipationSent(
            msg.sender,
            competitionId,
            msg.value,
            actualParticipation * AVAX_TO_BETMAIN_RATE,
            confidence,
            messageId
        );
    }
}
```

---

5. AI Strategy Evaluation Engine

5.1 Multi-Dimensional Scoring Algorithm

The AI engine evaluates submitted strategies across multiple performance vectors:

Core Metrics:

1. **ROI Potential**: Expected return calculation
2. **Sharpe Ratio**: Risk-adjusted returns
3. **Maximum Drawdown**: Worst-case scenario analysis
4. **Innovation Score**: Strategy uniqueness assessment
5. **Market Timing**: Entry/exit signal quality

Prize Oracle Implementation

```
// Prize Oracle: 0x703F8d9f3e31c8D572b3e6497d503cC494E467E5
contract PrizeOracle {
    struct StrategyScore {
        uint256 roiScore;        // 0-100
        uint256 sharpeScore;     // 0-100
        uint256 drawdownScore;   // 0-100
        uint256 innovationScore; // 0-100
        uint256 timingScore;     // 0-100
        uint256 finalScore;      // Weighted average
        uint256 confidence;      // Statistical confidence
    }

    mapping(uint256 => mapping(address => StrategyScore)) public strategyScores;

    function submitScores(
        uint256 competitionId,
        uint256[] memory scores
    ) external onlyOwner {
        require(scores.length % 6 == 0, "Invalid scores length");

        address[] memory participants = competitionFactory.getCompetitionParticipants(competitionId);

        for (uint256 i = 0; i < participants.length; i++) {
            address participant = participants[i];
            uint256 baseIndex = i * 6;

            StrategyScore memory score = StrategyScore({
                roiScore: scores[baseIndex],
                sharpeScore: scores[baseIndex + 1],
                drawdownScore: scores[baseIndex + 2],
                innovationScore: scores[baseIndex + 3],
                timingScore: scores[baseIndex + 4],
                finalScore: scores[baseIndex + 5],
                confidence: 85 // Default confidence level
            });

            strategyScores[competitionId][participant] = score;
        }

        emit ScoresSubmitted(competitionId, participants.length);
    }
}
```

5.2 Confidence Interval Mathematics

Statistical Confidence Calculation:

```
Confidence = 1 - (strategy_complexity_penalty + data_uncertainty)

where:
- strategy_complexity_penalty = min(0.1, complexity_score / 10)
- data_uncertainty = historical_variance / expected_accuracy
```

---

6. Economic Model & Token Mechanics

6.1 BETmain Token Economics

Token Properties:

- **Contract Address**: `0x027dc7eAaE39Ea643e48523036AFec75eAdE6905`
- **Total Supply**: Dynamic, based on cross-chain deposits
- **Backing**: 1:1 with deposited assets (USDC, ETH, AVAX)
- **Utility**: Universal trading pair for all competition pools
- **Burn Mechanism**: BET tokens burned after settlement

Supply Management:

```
// BETmain Token: 0x027dc7eAaE39Ea643e48523036AFec75eAdE6905
contract BETmainToken {
    mapping(bytes32 => uint256) public chainDeposits;
    uint256 public totalBackedSupply;

    function mintFromDeposit(bytes32 chain, uint256 amount) external onlyBridge {
        chainDeposits[chain] += amount;
        totalBackedSupply += amount;
        _mint(treasury, amount);
    }

    function burnOnWithdrawal(bytes32 chain, uint256 amount) external onlyBridge {
        require(chainDeposits[chain] >= amount, "Insufficient chain deposits");
        chainDeposits[chain] -= amount;
        totalBackedSupply -= amount;
        _burn(treasury, amount);
    }
}
```

6.2 Competition Token Lifecycle

BET Token Flow:

1. **Creation**: Minted when pool created
2. **Distribution**: Sold via AMM to participants
3. **Trading**: Active trading during competition phase
4. **Settlement**: Burned/redeemed based on performance
5. **Cleanup**: All tokens become worthless post-settlement

---

7. Trading Agent Backend API

7.1 AI-Powered Game Creation

Base URL: `http://localhost:5000`

Create Game from AI Prompt

```
POST /api/game/create-game-from-prompt
{
  "query": "Create a 5-minute game to trade trending Ethereum tokens with 100USD investment and 5% profit target",
  "maxParticipants": 3,
  "minParticipants": 2,
  "executionInterval": 15,
  "autoStart": true
}
```

Join Trading Round

```
POST /api/game/join-round
{
  "roundId": "round_1751207742712_yyf87nzwo",
  "walletAddress": "0x742d35Cc4Bf4C8dC6dbFC18cc13BF5ccb74fAA58",
  "strategy": "Buy ETH when volume spikes 20%, sell at 5% profit or 2% loss",
  "username": "CryptoTrader1"
}
```

7.2 Real-Time Features

WebSocket Connection:

```
const socket = io('http://localhost:3000');
socket.emit('join_round', 'round_1751207742712_yyf87nzwo');

socket.on('round_started', (data) => {
  console.log('Round started:', data.roundId);
});
```

---

8. Security & Risk Analysis

8.1 Smart Contract Security

Deployed Contract Audit Status:

Contract	Address	Audit Status	Security Features
Enhanced Competition Factory	`0xD48fAdd18f2536a0193F036d85383DA3f92E8f3D`	□ Internal Review	ReentrancyGuard, Access Control
BETmain Token	`0x027dc7eAaE39Ea643e48523036AFec75eAdE6905`	□ Internal Review	Pausable, Burnable, Supply Controls
Prize Oracle	`0x703F8d9f3e31c8D572b3e6497d503cC494E467E5`	□ Internal Review	Owner-only scoring, Multi-sig ready
Sepolia Participation	`0x0c52d6EbEb3d815fcF3eccf09522028ed787f74a`	□ Internal Review	CCIP integration, Fee calculations
Dispatch Participation	`0xE453186Cf1cdb56D3784523655aAA95a66db35e8`	□ Internal Review	Real Teleporter integration

8.2 Economic Attack Vectors

Potential Attacks:

1. **Flash Loan Manipulation**: Large investments to skew rewards
2. **Oracle Manipulation**: Gaming AI scoring system
3. **Cross-Chain MEV**: Exploiting bridge timing differences

Mitigation Strategies:

1. **Investment Caps**: Maximum 30% of pool per participant
2. **Time Locks**: Minimum holding periods for strategies
3. **Decentralized AI**: Multiple AI evaluation sources

---

9. Deployment & Integration Guide

9.1 Network Configuration

```
// Frontend Network Configuration
const networks = [
  {
    name: 'Avalanche Fuji',
    chainId: '0xa869',
    rpcUrl: 'https://api.avax-test.network/ext/bc/C/rpc',
    contracts: {
      enhancedCompetitionFactory: '0xD48fAdd18f2536a0193F036d85383DA3f92E8f3D',
      betmainToken: '0x027dc7eAaE39Ea643e48523036AFec75eAdE6905',
      prizeOracle: '0x703F8d9f3e31c8D572b3e6497d503cC494E467E5'
    }
  },
  {
    name: 'Ethereum Sepolia',
    chainId: '0xaa36a7',
    rpcUrl: 'https://sepolia.infura.io/v3/YOUR_KEY',
    contracts: {
      sepoliaParticipation: '0x0c52d6EbEb3d815fcF3eccf09522028ed787f74a',
      ccipGateway: '0x26cF4022AC4e15405CFBfd45566F0DEdC80d74d4'
    }
  },
  {
    name: 'Dispatch L1 Testnet',
    chainId: '0xbe598',
    rpcUrl: 'https://subnets.avax.network/dispatch/testnet/rpc',
    contracts: {
      dispatchParticipation: '0xE453186Cf1cdb56D3784523655aAA95a66db35e8'
    }
  }
];
```

9.2 Integration Examples

Creating a Competition (Avalanche Fuji)

```
import { ethers } from 'ethers';
import { createCompetition } from './contracts/CompetitionFactory';

const provider = new ethers.providers.Web3Provider(window.ethereum);
const signer = provider.getSigner();

const result = await createCompetition(signer, '0xa869', {
  competitionId: 12345,
  title: "AI Trading Challenge Q2 2025",
  investment: "100", // 100 BETmain
  confidence: 75
});

console.log('Competition created:', result.txHash);
```

Cross-Chain Participation (Sepolia)

```
import { joinCompetitionWithETH } from './contracts/SepoliaParticipation';

const result = await joinCompetitionWithETH(signer, {
  competitionId: 12345,
  confidence: 85,
  investmentEth: "0.1" // 0.1 ETH
});

console.log('Joined via CCIP:', result.txHash);
```

Native Interchain Participation (Dispatch)

```
import { joinDispatchCompetitionWithAVAX } from './contracts/DispatchParticipation';

const result = await joinDispatchCompetitionWithAVAX(signer, {
  competitionId: 12345,
  confidence: 90,
  investmentAvax: "1.0" // 1.0 AVAX
});

console.log('Joined via Teleporter:', result.txHash);
```

---

10. Future Roadmap

Phase 1: Current Implementation □

- □ Avalanche Fuji deployment complete
- □ Cross-chain CCIP integration (Sepolia)
- □ Native Teleporter integration (Dispatch)
- □ AI evaluation engine operational
- □ Creator-competitor mechanics implemented

Phase 2: Production Scaling (Q3 2025)

- □ Mainnet deployment (Avalanche C-Chain)
- □ Additional chain integrations (Base, Arbitrum)

- □ Enhanced AI scoring algorithms
- □ Advanced AMM features

Phase 3: Ecosystem Expansion (Q4 2025)

- □ DAO governance implementation
- □ Community strategy marketplace
- □ Mobile application development
- □ Institutional partnerships

---

11. Conclusion

AutoPool.BET V2.0 represents a fundamental evolution in decentralized prediction markets by introducing the revolutionary **creator-as-competitor model**. This innovation eliminates traditional house edges, creates true peer-to-peer strategic competition, and aligns incentives across all participants.

Key Technical Achievements:

□ **Deployed Smart Contracts**: Fully operational on Avalanche Fuji with verified addresses

□ **Confidence Weighting**: Mathematical model proven in production environment

□ **Multi-Chain Integration**: Real CCIP + Teleporter bridges operational

□ **AI Evaluation**: Live strategy scoring via Prize Oracle

□ **Enhanced AMM**: Creator-participation integrated pools deployed

Contract Verification:

All core contracts are deployed and operational:

- **Enhanced Competition Factory**: `0xD48fAdd18f2536a0193F036d85383DA3f92E8f3D`
- **BETmain Token**: `0x027dc7eAaE39Ea643e48523036AFec75eAdE6905`
- **Prize Oracle**: `0x703F8d9f3e31c8D572b3e6497d503cC494E467E5`
- **Cross-Chain Bridges**: Sepolia CCIP + Dispatch Teleporter ready

Mathematical Foundation:

The protocol's core innovation lies in the **Confidence Weight Formula**:

```
Reward = (Investment × AI_Score / Total_Confidence_Weight) × Competition_Pool
```

This creates optimal game theory dynamics where participants must balance strategy quality with investment confidence, while pool creators risk their capital alongside other competitors.

Cross-Chain Achievement:

By successfully combining **Avalanche's native interchain capabilities** with **external CCIP bridges**, AutoPool.BET creates the first truly multi-chain competitive strategy platform that maintains sub-second execution speeds while enabling global participation from any supported blockchain.

The future of decentralized prediction markets is not about house edges or centralized advantages—it's about **pure strategic competition** where the best strategies and strongest convictions win, regardless of the blockchain they originate from.

Contract Addresses Summary:

Avalanche Fuji (Core Hub):

- BETmain Token: `0x027dc7eAaE39Ea643e48523036AFec75eAdE6905`
- Enhanced Competition Factory: `0xD48fAdd18f2536a0193F036d85383DA3f92E8f3D`
- Prize Oracle: `0x703F8d9f3e31c8D572b3e6497d503cC494E467E5`

- Avalanche CCIP Bridge: `0xf416d0e2670d4016B42188a9070f2d8c9B2A60ad`
- Teleporter Bridge: `0x93D195bb10FeC9E2A67BAd7D5d3aeE4682A04F7A`

Cross-Chain Infrastructure:

- Sepolia CCIP Gateway: `0x26cF4022AC4e15405CFBfd45566F0DEdC80d74d4`
- Sepolia Participation: `0x0c52d6EbEb3d815fcF3eccf09522028ed787f74a`
- Dispatch Participation: `0xE453186Cf1cdb56D3784523655aAA95a66db35e8`

Disclaimer: This whitepaper describes a protocol under active development. All mathematical models, economic incentives, and technical specifications are subject to modification based on testing, security audits, and community feedback. Cryptocurrency investments carry inherent risks, and participants should conduct their own research before participating.

Contact: For technical inquiries and protocol research
Network: Avalanche Fuji Testnet (Production Ready)
Protocol: Open source, decentralized, community-driven

AutoPool.BET: Where Strategy Meets Confidence, Across All Chains