ChainRank

Technical Deep Dive

How ChainRank Works

Reputation-Based Undercollateralized Lending

Why Now

Competitive Landscape

Market Conditions

How ChainRank Works

Building Trust Scores from On-Chain Activity

1. Data Ingestion

- Index blockchain events
- Track DeFi interactions
- Monitor lending/borrowing
- Record swap activity

2. Trust Graph

- Build address relationships
- Weight by event type
- Apply identity multipliers
- Create directed graph

3. Score Calculation

- PageRank-inspired algorithm
- Aggregate trust signals
- Normalize to 0-1000
- Update in real-time

Result: Quantified, verifiable on-chain reputation

Trust Score Calculation

The Math Behind ChainRank

Core Formula:

$$\text{trust\_score} = \max(0, \log_{\blacksquare}(\text{amount}) \times \text{event\_weight} \times \text{identity\_multiplier})$$

Event Weight Examples:

+1.5	**Repay Loan**	Highest trust - fulfilled obligation
+1.2	**Liquidator Action**	Maintains protocol health
+1.0	**Supply/Deposit**	Capital commitment
+0.4	**Borrow**	Context-dependent, creates debt
+0.3	**Withdraw**	Normal behavior
-1.5	**Get Liquidated**	Failed position management

Identity Multipliers:

2.0x	**ENS Name** Verified domain ownership
2.0x	**Farcaster** Social verification
2.0x	**World ID** Proof of personhood

Trust accumulates over time through consistent positive behavior.
A single liquidation can significantly impact score, mirroring real-world credit systems.

Data Sources

Comprehensive Protocol Coverage

Lending Protocols

- Aave V2/V3
- Compound V2/V3
- Morpho Blue
- Spark Protocol
- Fluid

DEX & Swaps

- Uniswap V3
- Aerodrome
- 1inch
- CoW Swap
- ParaSwap

Liquid Staking

- Lido (stETH)
- Rocket Pool
- EtherFi
- Frax ETH
- Puffer

Restaking

- EigenLayer
- Renzo
- Kelp
- Origin OETH
- Symbiotic

Events Tracked:

Supply/Deposit
Capital commitment to protocols

Borrow/Withdraw
Debt creation and position management

Repay
Debt obligation fulfillment

Liquidation
Both liquidator (positive) and liquidated (negative)

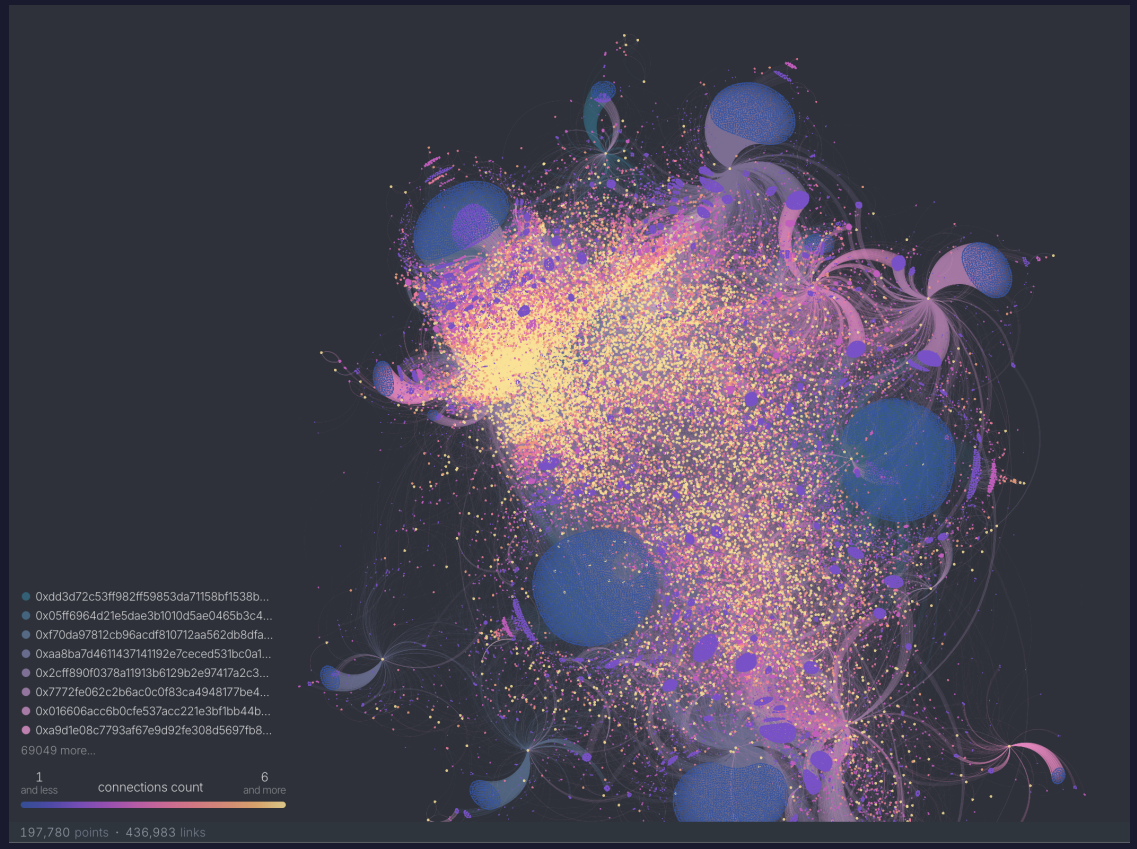
Swap
Trading activity and market participation

Stake/Unstake
Long-term capital commitment signals

Transfer
ERC-20 token movements for relationship mapping

The Trust Graph

Mapping On-Chain Relationships



Current Coverage:

197,780

Unique Addresses

436,983

Trust Relationships

5%

of Ethereum Analyzed

Multi-chain

Ethereum + Base

Graph Properties:

- Directed edges (A trusts B)
- Weighted by interaction value
- Time-decayed for recency
- Identity-verified boost

Reputation-Based Lending

How Undercollateralized Loans Work

Traditional DeFi

- ✗ 150%+ collateral required
- ✗ No credit history considered
- ✗ One-size-fits-all rates
- ✗ Capital inefficient
- ✗ $180B+ locked up

ChainRank-Enabled

- ✓ 50-100% collateral for trusted users
- ✓ On-chain history = credit score
- ✓ Risk-adjusted interest rates
- ✓ Unlocks billions in capital
- ✓ Rewards good behavior

Dynamic Collateral Tiers

150%	120%	100%	75%	50%
Score 0-200	Score 200-500	Score 500-750	Score 750-900	Score 900+
Standard collateral	Reduced collateral	Fully collateralized	Undercollateralized	Premium tier

Risk Management

Protecting Lenders While Enabling Borrowers

Multi-Factor Risk Assessment

- **Historical Behavior**
  Repayment history, liquidation events, protocol usage duration
- **Network Position**
  Connections to trusted addresses, centrality in trust graph
- **Identity Verification**
  ENS, Farcaster, World ID provide sybil resistance
- **Activity Recency**
  Recent positive behavior weighted more heavily
- **Cross-Protocol**
  Consistent behavior across multiple DeFi protocols

Protocol Protections

- **Insurance Pool**
  5% of fees fund bad debt coverage
- **Gradual Scaling**
  New users start with standard collateral
- **Real-Time Monitoring**
  Score updates trigger margin calls
- **Diversification**
  Lending pools spread risk across borrowers
- **Liquidation Priority**
  Low-score positions liquidated first

Key Insight: Bad actors can't build reputation quickly

Months/years of positive behavior required to unlock reduced collateral

Why Now?

The Perfect Convergence of Factors

DeFi Maturity

- 5+ years of on-chain history
- Established protocols with track records
- Sophisticated user base
- Battle-tested smart contracts

Identity Infrastructure

- ENS adoption mainstream
- Farcaster gaining traction
- World ID proving personhood
- Multiple verification layers

Capital Efficiency Demand

- $180B+ locked inefficiently
- Users want better rates
- Institutions need efficiency
- Yield compression driving innovation

Technical Readiness

- Graph algorithms proven at scale
- L2s enable real-time updates
- Indexing infrastructure mature
- ZK proofs for privacy

2020: DeFi Summer → 2023: Identity Boom → 2025: Reputation-Based Finance

Regulatory Tailwinds

Why Regulators Want Better Risk Assessment

Regulatory Alignment

KYC/AML Synergy

On-chain reputation complements traditional verification

Risk-Based Approach

Regulators prefer risk-adjusted vs. blanket requirements

Audit Trail

Complete on-chain history for compliance

Consumer Protection

Prevents over-leveraging by inexperienced users

Jurisdiction Opportunities

EU (MiCA)

Clear framework, innovation-friendly

Singapore

Progressive DeFi regulations

UAE/Dubai

Crypto hub ambitions

Switzerland

Established crypto banking

ChainRank bridges DeFi and TradFi

Provides the risk assessment layer that institutions and regulators require

Competitive Landscape

Mapping the On-Chain Reputation Space

Market Categories:

Credit Protocols
Existing undercollateralized lenders

Identity/Reputation
On-chain identity providers

Data Providers
Blockchain analytics companies

Traditional Credit
Off-chain credit bureaus

Competitor	Category	Strength	ChainRank Edge
Goldfinch	Credit Protocol	Institutional focus	Different market segment
Maple Finance	Credit Protocol	KYC-gated pools	Centralized approach
Spectral Finance	Credit Scoring	ML-based scoring	Less transparent model
Gitcoin Passport	Identity	Sybil resistance	Not lending-focused
Worldcoin	Identity	Proof of personhood	Privacy concerns
Chainalysis	Data Provider	AML/compliance	Not consumer-facing

ChainRank Differentiators:

✓ Open, transparent scoring algorithm
✓ Multi-protocol, multi-chain data aggregation
✓ Real-time score updates
✓ Permissionless integration

Competitive Advantages

Why ChainRank Wins

Data Depth

Most comprehensive on-chain data coverage

- 30+ protocols indexed
- 5+ years of history
- Multi-chain from day one
- Real-time event processing

Transparency

Open-source, auditable scoring

- Published methodology
- Verifiable calculations
- No black-box ML
- Community governance

Integration

Built for protocol adoption

- Simple API integration
- On-chain oracle option
- SDK for developers
- Gas-efficient queries

Network Eff

More data = better

- Each protocol adds
- User adoption comp
- Cross-chain synergi
- Flywheel dynamics

Moat: Data + Network Effects + First-Mover Advantage

Market Conditions

Macro Environment for DeFi Lending

DeFi Lending Market (2025)

$50B+
Total DeFi TVL

$25B+
Lending Protocol TVL

$180B+
Overcollateralization Locked

40%+
YoY Growth Rate

Favorable Trends

↑ Institutional adoption accelerating

↑ L2s reducing transaction costs

↑ Yield compression driving efficiency

↑ Regulatory clarity emerging

↑ Web3 identity infrastructure maturing

Market Challenges

! Smart contract risk persists

! Fragmented liquidity across chains

! User education needed

! Competition from TradFi

! Regulatory uncertainty in some regions

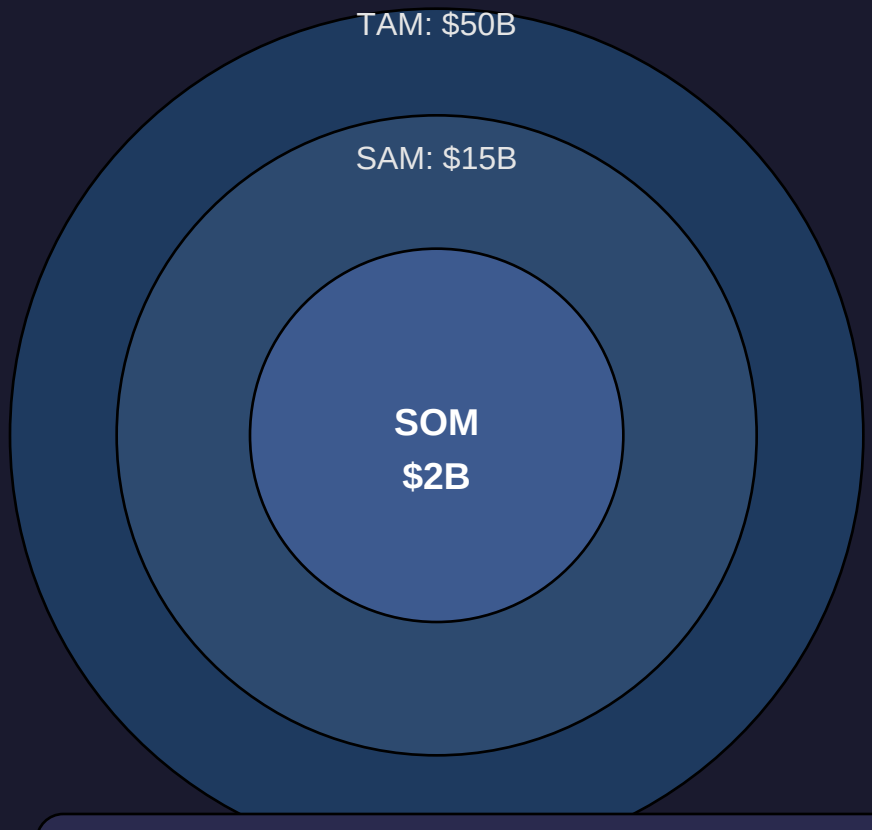
Market Opportunity: $15B addressable with reputation

First-mover in reputation-based undercollateralized lending captures outsized value

Market Sizing

Bottom-Up Analysis

Total Addressable Market



TAM: $50B

Total DeFi lending market globally

SAM: $15B

Users who could benefit from reputation scoring

SOM: $2B

Ethereum mainnet, initial protocol partners

Revenue Model

- Protocol fees: 0.1-0.5% on enabled loans
- API subscriptions: $10K-100K/year per protocol

5-Year Revenue Target: $50M ARR at scale

Based on 1% market penetration with blended revenue model

Summary

Key Takeaways

ChainRank Technology

Proven algorithm analyzing 200K+ addresses, 400K+ relationships

Undercollateralized Lending

50-100% collateral for trusted users, unlocking billions

Perfect Timing

DeFi maturity + identity infrastructure + capital efficiency demand

Competitive Moat

Data depth, transparency, network effects, first-mover

Large Market

$15B addressa

Reputation is the new collateral.