

Resumé

Siddhartha Annapureddy

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Objective Obtain a challenging full-time position in the area of distributed systems, peer-to-peer systems, operating systems, and systems security.

Education

New York University Sep. 2002 – Jan. 2008
Ph.D. and M.S. in Computer Science
Advisor: Prof. David Mazières

Stanford University Sep. 2005 – Jan. 2008
Research Scholar
Advisor: Prof. David Mazières

Indian Institute of Technology Madras Jul. 1998 – Jul. 2002
B.Tech. in Computer Science

Work Experience

Dyyno Inc. Oct. 2007 – Present

Designed and developed the *Dyyno Peer-to-Peer Module* (DPPM), a novel system to deliver high-quality live video, with very low latency, to thousands of viewers over the Internet. The challenges include ensuring connectivity across NATs/firewalls, dynamically rearranging the overlay for efficiency and resilience, retransmissions to recover from churn/losses, avoidance and control of congestion, security issues like authentication of different entities, guaranteeing data integrity, privacy etc.

Lead the design and development of *ServiceManager*, a P2P system to manage Dyyno's dynamic server farm. The goal is to satisfy Dyyno's workload reliably and by using minimal resources. The challenge involves gathering per-server resource usage (for load-balancing), updating the network of service allocators with this information, and thus achieve efficient allocation of resource requests.

Honours

2002 Henry-McCracken and the Dean's Fellowship by the New York University.

1999 First Prize in the Mathematics Olympiad conducted by the Department of Mathematics, IITM.

1998 Merit Prize for placing 88th of 100,000 candidates in the All India IIT-JEE.

1998 9th place in State Talent Search Examination (STSE) conducted by the A.S.Rao Awards Council.

Publications

Is High-Quality VoD Feasible using P2P Swarming?

Siddhartha Annapureddy, Saikat Guha, Christos Gkantsidis, Dinan Gunawardena, and Pablo Rodriguez.
In Proc. of the 16th World Wide Web (WWW), May 2007.

Exploring VoD in P2P Swarming Systems.

Siddhartha Annapureddy, Saikat Guha, Christos Gkantsidis, Dinan Gunawardena, and Pablo Rodriguez.
In Proc. of the 26th IEEE International Conference on Computer Communications (InfoCom) Minisymposium, May 2007.

Shark: Scaling File Servers via Cooperative Caching.
Siddhartha Annapureddy, Michael J. Freedman and David Mazières.
In Proc. of the Network Systems Design and Implementation (NSDI), May 2005.

P2PCast: A Peer-to-Peer Multicast Scheme for Streaming Data.
Antonio Nicolosi and Siddhartha Annapureddy.
In Proc. of the the First IRIS Student Workshop on Peer-to-Peer Systems, Aug 2003.

Patents

- Allocating resources of a node in a server farm.
Siddhartha Annapureddy and Pierpaolo Baccichet.
- Formatting information for transmission over a communication network.
Anne Aaron, Siddhartha Annapureddy, Pierpaolo Baccichet, Bernd Girod et. al.
- Sharing of information over a communication network.
Anne Aaron, Siddhartha Annapureddy, Pierpaolo Baccichet, Bernd Girod et. al.
- Multiway peer-to-peer media streaming.
Eric Setton, Siddhartha Annapureddy, and John Apostolopoulos.
- Progressive downloading.
Christos Gkantsidis, Pablo Rodriguez, Siddhartha Annapureddy, and Dinan Gunawardena.

Research

StarTalk: The goal is to enable panel discussions over the Internet using P2P networks. Panelists communicate with each other (audio/video with ~ 200 ms latency) using a resilient mesh-based network. The audience of the discussion then obtains this data using a second multiple-tree-based P2P network with a <4 s latency. The challenges involved blending two distinct P2P systems to ensure low-latency. Research done as an intern at HP Labs, Palo Alto during the summer of 2007.

RedCarpet: The goal is to provide near-Video-on-Demand services over the Internet using unstructured P2P networks. A user should be able to watch a video without interruption, after waiting for a small setup time. We propose three techniques, network coding, segment scheduling, and topology management that significantly improve the performance of the system. Research done as an intern at Microsoft Research, Cambridge during the summer of 2005.

Shark: The goal is to enable a file server to handle a large volume of requests as the number of clients increases. Towards this end, designed and implemented a distributed file system where the participants cache the data that they fetch. These caches are used to satisfy requests from other clients, thereby alleviating the load on the server. Our design is both scalable and secure, and ensures locality.

HydraFS: Designed a local filesystem on top of a P2P storage backend. The backend differs radically from traditional disk drives. It is content addressable, efficient only for large writes and data blocks expire after a certain time interval. Addressed these challenges and came up with a filesystem that also provides good resilience and continuous backup. Research done as part of an internship at NEC Labs during the summer of 2004.

P2PCast: The aim is to enable anyone behind a cable modem to disseminate streaming content with the cooperation of other interested users. Designed a novel P2P application-level multicast scheme by organizing the users into a forest of (almost) balanced trees. The scheme is fully decentralized, scalable and fault tolerant.

Course Work

Honors OS, Advanced Database Systems, Honors Algorithms, Honors Theory of Computation, Advanced Topics in Cryptography, The Art of Counting, Introduction to Computational Number Theory and Algebra, Random Graphs. Audited High Performance Architecture.