WHAT IS CLAIMED IS:

1. A computer-implemented method for evaluating candidate encoding ladders to use when streaming a media title, the method comprising:

generating a first streaming header based on a first plurality of rungs associated with a first candidate encoding ladder, wherein each rung included in the first plurality of rungs specifies a resolution and a bitrate of a different encoded video included in a plurality of encoded videos;

executing an adaptive bitrate algorithm on the first streaming header over a first plurality of simulated streaming sessions based on a first plurality of network throughput traces to compute a first metric value for a first metric based on a parameterized objective function, wherein the parameterized objective function receives, as input, both a quality of experience and one or more cost terms associated with the first candidate encoding ladder for each simulated streaming session included in the first plurality of simulated streaming sessions, and the parameterized objective function outputs the first metric value that is a single value for the first metric;

generating a second streaming header based on a second plurality of rungs associated with a second candidate encoding ladder;

executing the adaptive bitrate algorithm on the second streaming header over a second plurality of simulated streaming sessions based on the first plurality of network throughput traces to compute a second metric value for the first metric based on the parameterized objective function, wherein the parameterized objective function receives, as input, both a quality of experience and one or more cost terms associated with the second candidate encoding ladder for each simulated streaming session included in the second plurality of simulated streaming sessions, and the parameterized objective function outputs the second metric value that is a single value for the first metric; and

comparing the first metric value to the second metric value to determine that the first candidate encoding ladder instead of the second candidate encoding ladder should be used to stream the media title.

2. The computer-implemented method of claim 1, wherein generating the first streaming header comprises:

determining a sequence of encoded chunks based on a first encoded video specified by a first rung included in the first plurality of rungs; and

determining a plurality of bitrates associated with the sequence of encoded chunks.

3. The computer-implemented method of claim 1, wherein executing the adaptive bitrate algorithm on the second streaming header comprises:

generating a first request for a first encoded chunk based on a first network throughput specified in the first plurality of network throughput traces; and

computing the second metric value based on a first quality score associated with the first encoded chunk.

4. The computer-implemented method of claim 1, wherein the quality of experience associated with the first candidate encoding ladder represents at least one of a visual quality score, a total number of re-buffering events, or a total re-buffering time associated with streaming the media title using the first streaming header.

5. The computer-implemented method of claim 4, wherein the visual quality score comprises an average peak signal-to-noise-ratio, an average video multimethod assessment fusion score, or a time-weighted video multimethod assessment fusion score.

6. The computer-implemented method of claim 1, wherein the first metric value approximates a tradeoff between the quality of experience and the one or more cost terms associated with the first candidate encoding ladder.

7. The computer-implemented method of claim 1, wherein the first candidate encoding ladder and the second candidate encoding ladder are included in a plurality of candidate encoding ladders that are generated based on the parameterized objective function and a plurality of parameterized constraints.

8. The computer-implemented method of claim 1, wherein the first plurality of network throughput traces comprises recorded measurements of one or more characteristics of a first network over a first period of time.

9. The computer-implemented method of claim 1, wherein a first number of rungs included in the first plurality of rungs is not equal to a second number of rungs included in the second plurality of rungs.

10. The computer-implemented method of claim 1, further comprising performing one or more additional operations on the first candidate encoding ladder to generate a final encoding ladder that is used to stream the media title to one or more client devices over a network.

11. The computer-implemented method of claim 1, wherein the one or more cost terms associated with the first candidate encoding ladder include at least one of a storage footprint associated with the first candidate encoding ladder or a network bandwidth consumption associated with streaming the first candidate encoding ladder.

12. The computer-implemented method of claim 1, wherein the quality of experience associated with the first candidate encoding ladder for each simulated streaming session included in the first plurality of simulated streaming sessions is determined based on a weighted average of a subset of quality scores for a plurality of encoded chunks of the plurality of encoded videos associated with the first candidate encoding ladder.

13. The computer-implemented method of claim 1, wherein the first plurality of network throughput traces comprises a plurality of synthesized network throughput traces.

14. One or more non-transitory computer readable media including instructions that, when executed by one or more processors, cause the one or more processors to evaluate candidate encoding ladders to use when streaming a media title by performing the steps of:

generating a first streaming header based on a first plurality of rungs associated with a first candidate encoding ladder, wherein each rung included in the first plurality of rungs specifies a resolution and a bitrate of a different encoded video included in a plurality of encoded videos;

executing an adaptive bitrate algorithm on the first streaming header over a first plurality of simulated streaming sessions based on a first plurality of network throughput traces to compute a first metric value for a first metric based on a parameterized objective function, wherein the parameterized objective function receives, as input, both a quality of experience and one or more cost terms associated with the first candidate encoding ladder for each simulated streaming session included in the first plurality of simulated streaming sessions, and the parameterized objective function outputs the first metric value that is a single value for the first metric;

generating a second streaming header based on a second plurality of rungs associated with a second candidate encoding ladder;

executing the adaptive bitrate algorithm on the second streaming header over a second plurality of simulated streaming sessions based on the first plurality of network throughput traces to compute a second metric value for the first metric based on the parameterized objective function, wherein the parameterized objective function receives, as input, both a quality of experience and one or more cost terms associated with the second candidate encoding ladder for each simulated streaming session included in the second plurality of simulated streaming sessions, and the parameterized objective function outputs the second metric value that is a single value for the first metric; and

comparing the first metric value to the second metric value to determine that the first candidate encoding ladder instead of the second candidate encoding ladder should be used to stream the media title.

15. The one or more non-transitory computer readable media of claim 14, wherein generating the first streaming header comprises:

determining a sequence of encoded chunks based on a first encoded video specified by a first rung included in the first plurality of rungs; and

determining a plurality of quality scores associated with the sequence of encoded chunks.

16. The one or more non-transitory computer readable media of claim 14, wherein executing the adaptive bitrate algorithm on the first streaming header comprises generating a sequence of requests for a sequence of encoded chunks based on the first streaming header and a sequence of network throughputs included in the first plurality of network throughput traces.

17. The one or more non-transitory computer readable media of claim 14, wherein the quality of experience associated with the first candidate encoding ladder represents at least one of a visual quality score, a total number of re-buffering events, or a total re-buffering time associated with streaming the media title using the first streaming header.

18. The one or more non-transitory computer readable media of claim 14, wherein the quality of experience associated with the second candidate encoding ladder represents at least one of a visual quality score, a total number of rung switches, or a frequency of rung switching associated with streaming the media title using the second streaming header.

19. The one or more non-transitory computer readable media of claim 14, wherein the first metric value approximates a tradeoff between the quality of experience and the one or more cost terms associated with the first candidate encoding ladder.

20. The one or more non-transitory computer readable media of claim 14, wherein the first candidate encoding ladder and the second candidate encoding ladder are included in a plurality of candidate encoding ladders that are generated based on the parameterized objective function and a plurality of parameterized constraints.

21. The one or more non-transitory computer readable media of claim 14, wherein the first plurality of network throughput traces comprises recorded measurements of one or more characteristics of a first network over a first period of time.

22. The one or more non-transitory computer readable media of claim 14, wherein a first resolution specified in a first rung included in the first plurality of rungs is different than a second resolution specified in a second rung included in the first plurality of rungs.

23. A system comprising:

one or more memories storing instructions; and

one or more processors coupled to the one or more memories that, when executing the instructions, perform the steps of:

generating a first streaming header based on a first plurality of rungs associated with a first candidate encoding ladder, wherein each rung included in the first plurality of rungs specifies a resolution and a bitrate of a different encoded video included in a plurality of encoded videos;

executing an adaptive bitrate algorithm on the first streaming header over a first plurality of simulated streaming sessions based on a first plurality of network throughput traces to compute a first metric value for a first metric based on a parameterized objective function, wherein the parameterized objective function receives, as input, both a quality of experience and one or more cost terms associated with the first candidate encoding ladder for each simulated streaming session included in the first plurality of simulated streaming sessions, and the parameterized objective function outputs the first metric value that is a single value for the first metric;

generating a second streaming header based on a second plurality of rungs associated with a second candidate encoding ladder;

executing the adaptive bitrate algorithm on the second streaming header over a second plurality of simulated streaming sessions based on the first plurality of network throughput traces to compute a second metric value for the first metric based on the parameterized objective function, wherein the parameterized objective function receives, as input, both a quality of experience and one or more cost terms associated with the second

candidate encoding ladder for each simulated streaming session included in the second plurality of simulated streaming sessions, and the parameterized objective function outputs the second metric value that is a single value for the first metric; and

comparing the first metric value to the second metric value to determine that the first candidate encoding ladder instead of the second candidate encoding ladder should be used to stream a media title.