AGTk-based Shared Movie Player

Robert Olson

The Problem

- Synchronized viewing of a movie file at multiple sites

Challenges

- Determination and definition of “session”
- Movie file distribution
- Synchronization of start/stop/change position

Sessions

- A single instance of a shared movie playing session
- State:
  - Current movie being played
  - Current position in the movie
  - Current state (playing, paused, stopped, etc)

Sessions, cont.

- Session represented as an AGTk application object
  - App obj holds a dictionary containing state, and an event channel for realtime communication

Session data

- currentMovieType
  - Currently, only supports movies in the datastore
- currentMovieStore
  - URL to the datastore holding the movie
- currentMovieFile
  - Filename of the movie in the datastore
- state
  - Current state (playing, stopped, etc)
- position
  - Current position in the movie (in seconds)

File distribution

- Movie files placed in Venue datastore
- Session state used to retrieve current file
- Clients' loading new file causes event to be distributed notifying clients of new file

State Synchronization

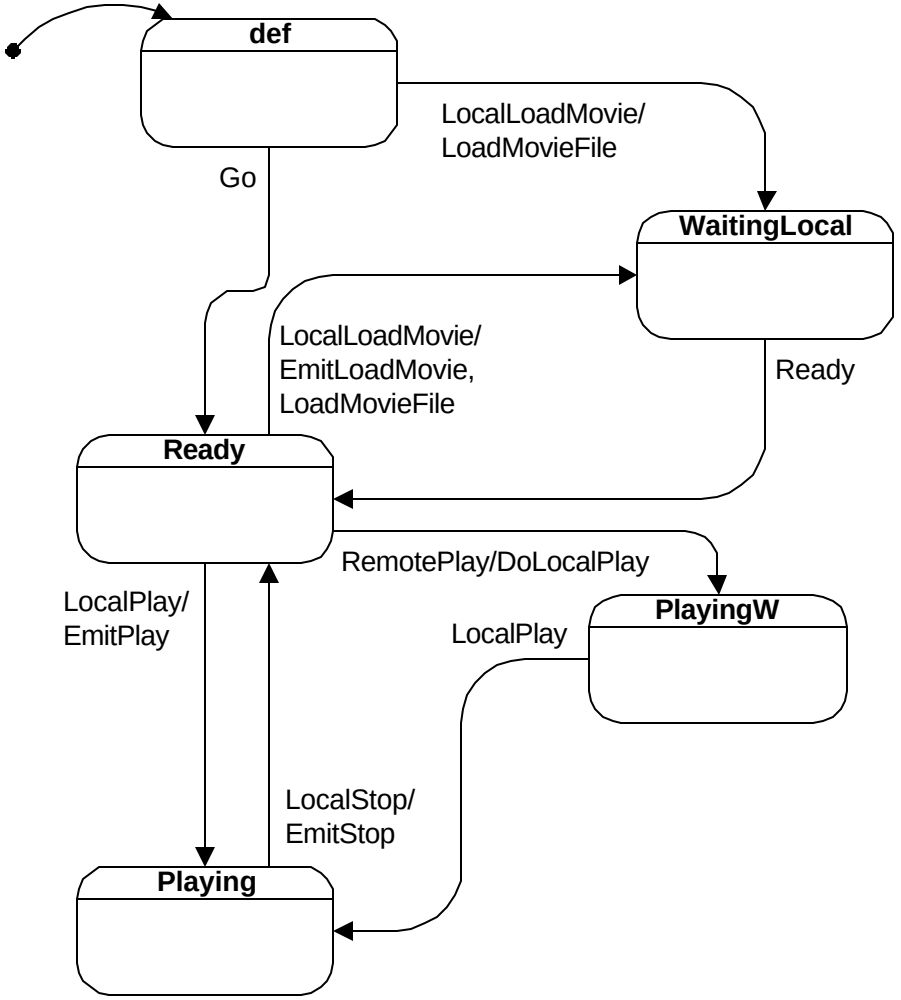
- Venue event channel used to distribute state update messages:
  - status_changed
    - Emitted when a user starts or stops the movie
  - new_movie
    - Emitted when a user loads a new movie file
  - position_changed
    - Emitted when a user changes the position of a movie playback

Client Considerations

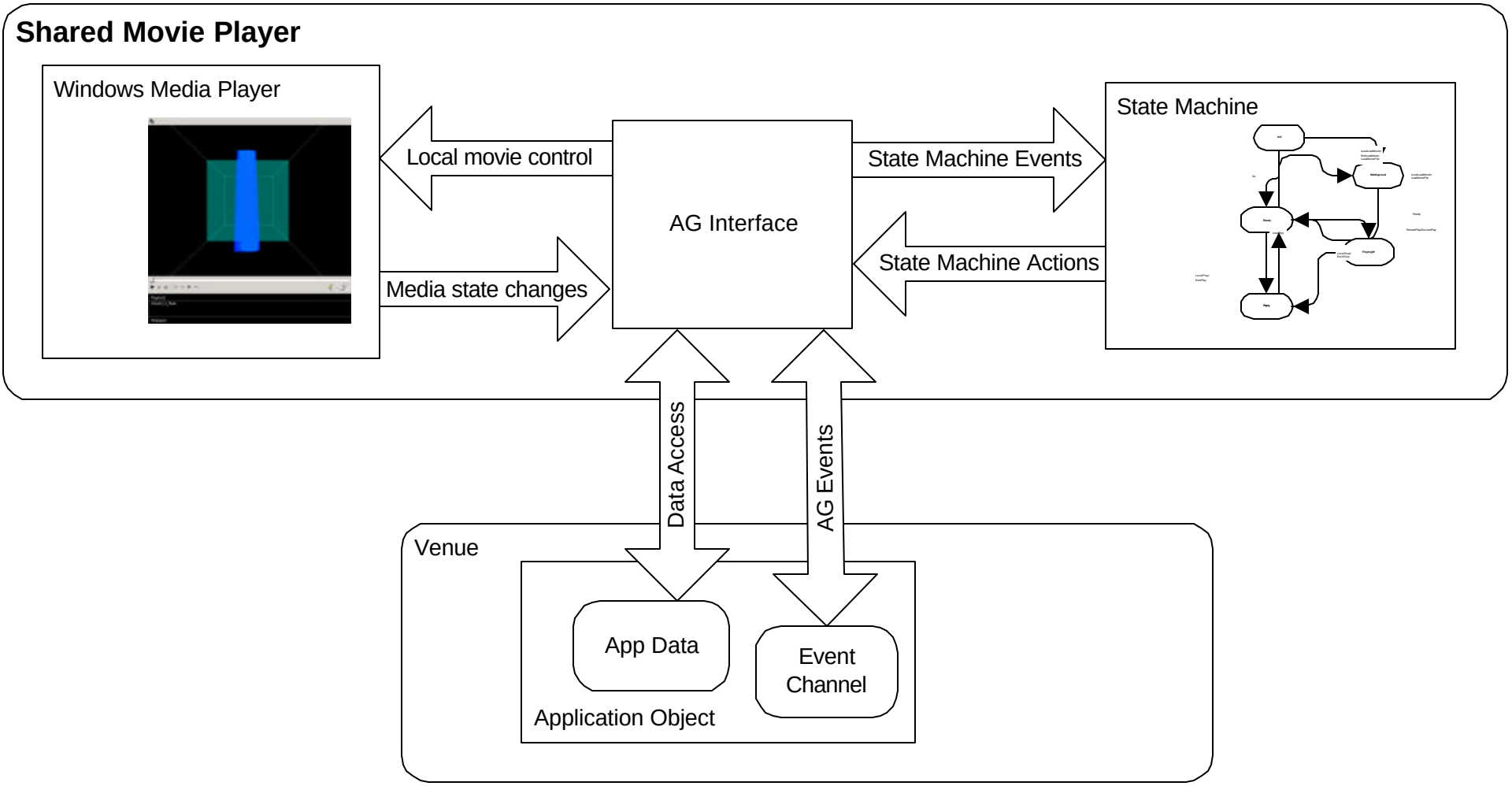
- On Windows, video rendered by embedded Windows Media Player
- Uses native media player controls (play, stop, set position)
- Complication: programmatically generated media player control generates local feedback that’s the same as manual control

Client, cont.

- Complexities of client state manipulation handled with an explicit state machine



AG Integration



Distributed State

- Event channel used to distribute effects of user changes (Play, Stop, Load, etc)
- Potential for races, etc
  - No global ordering of messages
- What effect does this have?
  - Possible confusion if multiple people manipulate state at the same time
- Social protocols should help
- Full distributed control algorithms would help more, but require strong ordering semantics in communications

Membership

- Calculation of membership is approximate (see previous slide on event channel semantics)
- Used as advisory means: user feedback
- Mechanism: new events:
  - client_join (on first joining)
  - client_present (keepalive)
  - client_leave (on exiting)

What’s next?

- Streaming video support ?
- Tighter synchronization (avoid net-lag problems)
- Synchronized playback with Tiled Display movie players
- Linux support (mplayer? xanim?)