Massachusetts Institute of Technology

ILLINOIS
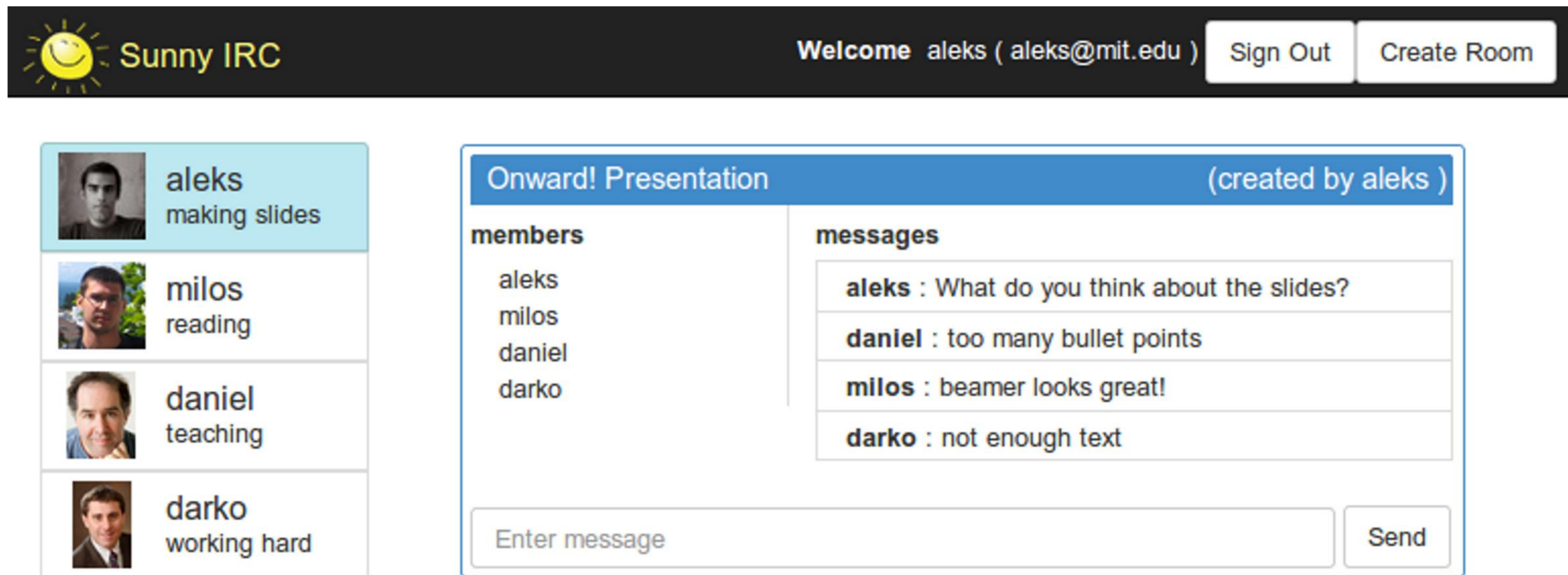UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN
1867

Sunny: From Models to Interactive Web Apps
for (almost) free

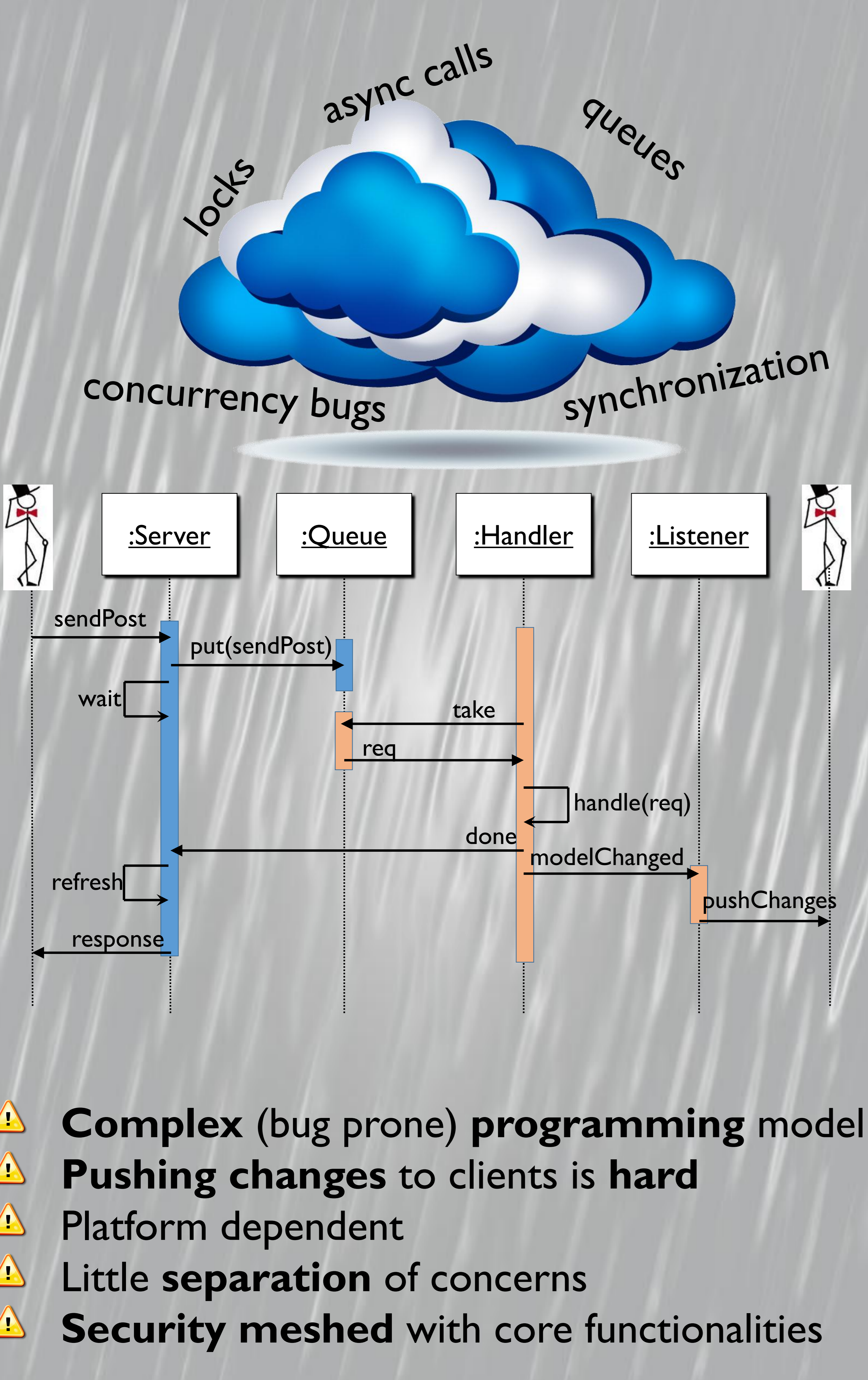**Aleksandar Milicevic, Daniel Jackson**
{aleks,dnj}@csail.mit.edu

Milos Gligoric, Darko Marinov
{gliga,marinov}@Illinois.edu

1. Consider implementing an IRC app

2. traditional approaches vs. Sunny

model

```
record User \           record Msg [      record ChatRoom [
    extends WebUser [      sender: User,     name: String,
    status: String        text: String      members: (set User),
]                       ]                   messages: (set Msg)
                                          ]
```

behavior

```
event JoinRoom do
  from client: Client; to server: Server
  params room: ChatRoom
  requires { !room.members.include?(client.user) }
  ensures  { room.members << client.member }
end
```

privacy & security

```
policy P do
  principal client: Client

  @desc = "Can't edit other people's data"
  write User.*.when do |user| client.user == user end

  @desc = "Hide 'busy' users"
  restrict Client.user.when do |c|
   c != client && c.user.status == "busy"
  end
end
```

⚠ **Complex** (bug prone) **programming** model
⚠ **Pushing changes** to clients is **hard**
⚠ Platform dependent
⚠ Little **separation** of concerns
⚠ **Security meshed** with core functionalities

3. Benefits of the model-driven approach

- Automatic management of data resources, synchronization, event requests, database
- Automatic server-push keeps the GUI always updated
- Monitored access to data resources; privacy/security policies checked at every access
- Generic platform for programming a whole class of event-driven system

event-driven apps   similar to   spreadsheets   cms