My Responsibility

• Lectures Mon and Wed, 12:00-1:20
  – Live video conferencing at some sites
  – Recorded lectures posted online within 24hrs
• Google+ Hangout, Thu 12:00-1:00
  – For remote course participants
• Office Hour, Thu 1:00-2:00 (GHC 9101)
• Website
  www.cs.cmu.edu/~fp/courses/15816-s12/
Your Responsibility

• Class participation (if you are [tele]present)
• Mailing List linlog-course@cs.cmu.edu
  – Discussion and announcements; please subscribe!
• Homework assignments (60%)
  – 6 weekly assignments up to midterm (individual)
  – 3 biweekly assignments after midterm (small groups)
  – Let me know if you have your heart set on project
• Midterm exam (15%), March 7
  – Closed notes, in class (80 minutes)
• Final exam (25%), date TBA
About Linear Logic

• Jean-Yves Girard (1987)
  – Inspired by a mathematical semantics
  – Changed the way we view logic and computation
  – Changed the way we approach proof theory

• My approach
  – Inspired by Dummett (1976) and Martin-Löf (1983)
  – Systematic internal justification of (linear) logical laws
  – Will relate these views

• Part of a family of substructural logics
  – Lambek calculus, affine logic, strict logic, relevance logic, ordered logic, bunched logic, separation logic, ...
About Linear Logic

• A logic of state or resources

• Numerous applications in computer science
  – Logic programming (imperative, concurrent)
  – Functional programming (machines, complexity)
  – Concurrency (session types, geometry of interaction)
  – Object-oriented programming (typestate)

• Numerous applications in logic
  – Understanding structural rules
  – Focusing and polarization
  – Resource semantics
  – Knowledge and possession
Course Outline

• Part I: Fundamentals
  – Systematic development of linear logic
  – Understanding its intrinsic properties
  – Intuition from guiding examples and applications

• Part II: Applications
  – Study selected applications
  – Team assignments for further investigation

• Part III: Frontier?

• Today: Deductive Inference