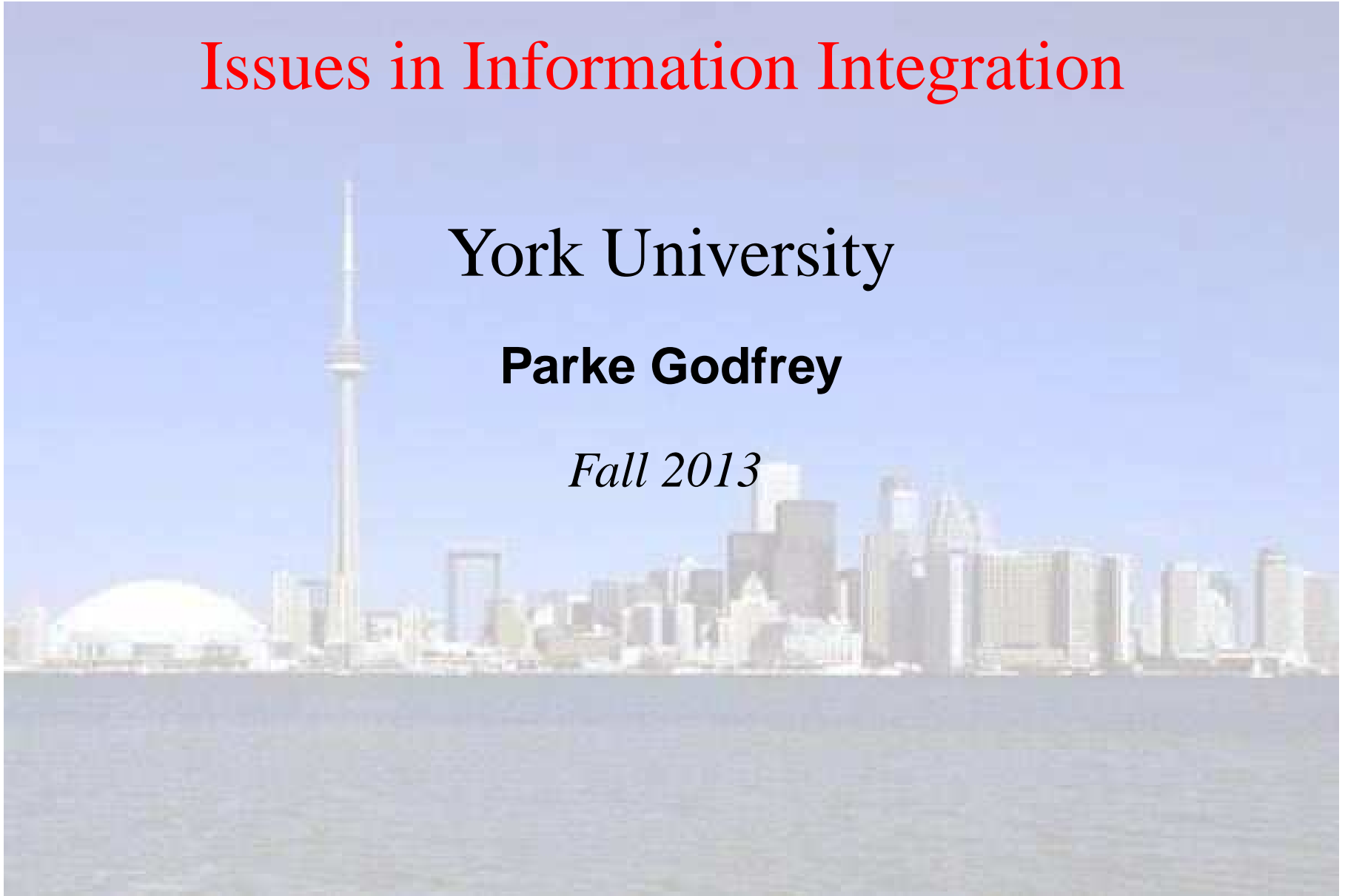# CSE-6490B

Issues in Information Integration

York University

Parke Godfrey

Fall 2013

What is Information Integration?

And why do we need it?

"The center cannot hold." Yeats

What is Information Integration?
And why do we need it?

"The center cannot hold." Yeats

Information is distributed over many sources / databases.

- Cannot have *everything* in one database under one schema.

- Sometimes the information we need must be composed from several sources.

- Sometimes we do not know *where* the information that we need resides.

The Katrina Disaster

- How to coördinate the different agencies? E.g., supplies.

- How to locate the missing people?

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Schema Exercise:

For each located person, record his or her name, date-of-birth, some form of identification, and (previously) permanent address. Record contact information (e.g., phone numbers) for the located people. Record for each closest relatives. Record which shelter the person is residing in. (He or she may have moved from one shelter to another. Remember previous shelters and durations.)

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all about the same thing

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- **model heterogeneity**. The data models may differ. E.g., one is a relational database, one an XML database, one a spreadsheet, and another a textfile.

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- **global inconsistency**. Each database alone is *locally* consistent, but taken together they are *globally* inconsistent.

  - E.g.,
    - One DB says that *Parke Godfrey* is in a temporary shelter in Baton Rouge. Another says he is in Atlanta.
    - The identity problem: Are the two *Parke Godfrey*'s the same person?
  - Is there any way to make the global view consistent?
  - Can we modify the query answering procedure to produce *consistent* answers even though the global view is *inconsistent*?

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versus, say, data?

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It is all about *schemas* and *queries*.

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versus, say, data?

It is all about *schemas* and *queries*.

We need good tools for working with, and reasoning about, *schemas* and *queries*.

- When are two schemas the same?

- When are two queries logically the same?

- How can schemas be unified?

- How can a query be parsed into sub-queries for multiple sources?

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each about something different
(but overlapping)

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Big issues:

- schema integration

- schema mapping

- optimization & caching