

### 1.6.1 The relationship between ML and other fields

There are several subcommunities that work on ML-related topics, each of which have different names. The field of **predictive analytics** is similar to supervised learning (in particular, classification and regression), but focuses more on business applications. **Data mining** covers both supervised and unsupervised machine learning, but focuses more on structured data, usually stored in large commercial databases. **Data science** uses techniques from machine learning and statistics, but also emphasizes other topics, such as data integration, data visualization, and working with domain experts, often in an iterative feedback loop (see e.g., [BS17]). The difference between these areas is often just one of terminology.<sup>12</sup>

---

12. See <https://developers.google.com/machine-learning/glossary/> for a useful “ML glossary”.

Author: Kevin P. Murphy. (C) MIT Press. CC-BY-NC-ND license

ML is also very closely related to the field of **statistics**. Indeed, Jerry Friedman, a famous statistics professor at Stanford, said<sup>13</sup>

[If the statistics field had] incorporated computing methodology from its inception as a fundamental tool, as opposed to simply a convenient way to apply our existing tools, many of the other data related fields [such as ML] would not have needed to exist — they would have been part of statistics. — Jerry Friedman [Fri97b]

Machine learning is also related to **artificial intelligence (AI)**. Historically, the field of AI assumed that we could program “intelligence” by hand (see e.g., [RN10; PM17]), but this approach has largely failed to live up to expectations, mostly because it proved to be too hard to explicitly encode all the knowledge such systems need. Consequently, there is renewed interest in using ML to help an AI system acquire its own knowledge. (Indeed the connections are so close that sometimes the terms “ML” and “AI” are used interchangeably, although this is arguably misleading [Pre21].)