

## From Keywords to SQL: Approaches to Search over Structured Data

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When answering a keyword query on data with structure (e.g., a relational database), the conceptual process translates the query into one or more fully specified database queries (e.g., SQL), aiming to capture the user intent, and then answers those database queries. I will discuss various approaches to modeling and realizing this task. The data-connection approach views the database as a graph of items, and finds connected subgraphs (typically subtrees) connecting items that match the keywords. In the schema-connection approach, candidate queries connecting the keywords are constructed from the schema (regardless of the data), while different schema constraints are followed to impose coherence of the queries. Finally, the grammatical approach carries the translation by applying rewrite rules that specify, among other things, term replacements, associations of keywords with schema concepts, and joins among those concepts. For each of these approaches, I will discuss involved research challenges, such as formal modeling and theoretical/practical complexity, and describe established results, while focusing on the past and current research with which I have been involved.