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Binary Inductive Logic

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The term *Inductive Logic* was introduced by Rudolf Carnap in the 1940's to denote the study of the 'degree of confirmation' that observations Δ provide for a hypothesis Γ based on *purely logical considerations*. Typically today Δ and Γ are taken to be sentences of some first order predicate language and degree of confirmation is identified with subjective probability, thus locating Inductive Logic within Predicate Uncertain Reasoning.

The methodology however remains (as far as I am concerned) based on postulating logical principles relating to the properties one might rationally expect of 'degree of confirmation' and investigating their consequences. In particular the confirmation relation is seen as an extension of logical consequence (where the degree of confirmation takes its top value 1).

Until very recently almost all the work in Inductive Logic beyond the most basic level had involved only unary languages. There certainly had been the intention to move beyond this but the emergence of Goodman's Grue Paradox in the 1946 caused Carnap and his followers to eventually lose heart in the practicality of the endeavour and the programme stalled.

The development in recent times of uncertain reasoning as a serious topic in AI however has give the impetus to restart this programme. In particular the impracticalities for human reasoning that caused despair in Carnap need no longer be so for artificial agents.

In my talk I shall survey recent attempts by myself and colleagues to extend the methodology of unary Inductive Logic to higher arity relations, in particular to the binary case which has the advantage of (relative) notational simplicity and apparently exhibits all the key new aspects.