Automatic HC trap prospecting with seismic data

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ABSTRACT
The purpose of this project is to develop a real-time interpretation package that will be capable of finding structural and stratigraphic traps on seismic data. Should it succeed, I further propose that the capability will make me rich. The method will be based on a LB single-phase fluid flow modeling algorithm.
1. The idea

The identification of structural and stratigraphic traps on a seismic section is of paramount importance for the exploration of hydrocarbons (HC). Automating the identification of likely traps could have four major contributions:

- greatly speed initial reconnaissance of new data,
- physically identify closures with shallow dip structure,
- aid in reservoir volumetrics, and
- assist in the understanding of HC migration.

A real-time algorithm that can accomplish these tasks can provide excellent qualitative information, limited quantitative scoping information, and quite possibly make me wealthy.
2. Approaches

- Percolation
  Fail! The whole section fills up

- Seed and Fill
  Fail! Needs global knowledge

- Flow modeling
  Global knowledge
  Single phase flow is fast(er)
  Single phase flow requires pool-proxy
3. **Conclusions**

- Maybe it is impossible
  
  Still too slow--Seems to require Global Solution
  
  Increased P gradient misses channels
  
  Decreased P gradient slows convergence
  
  Pools are not well formed -not so bad
  
  Directionality does not help
Figure 1: Simple model
Figure 2: Simple model
Figure 3: Simple model \textit{synflow} [NR]
Figure 4: Simple model [poolsynostruc] [NR]
Figure 5: Simple model poolsyn [NR]
Figure 6: Simple model synflowside [NR]
Figure 7: Simple model

seismic data
Figure 8: Simple model [binseis] [NR]
Figure 9: Simple model | [NR]