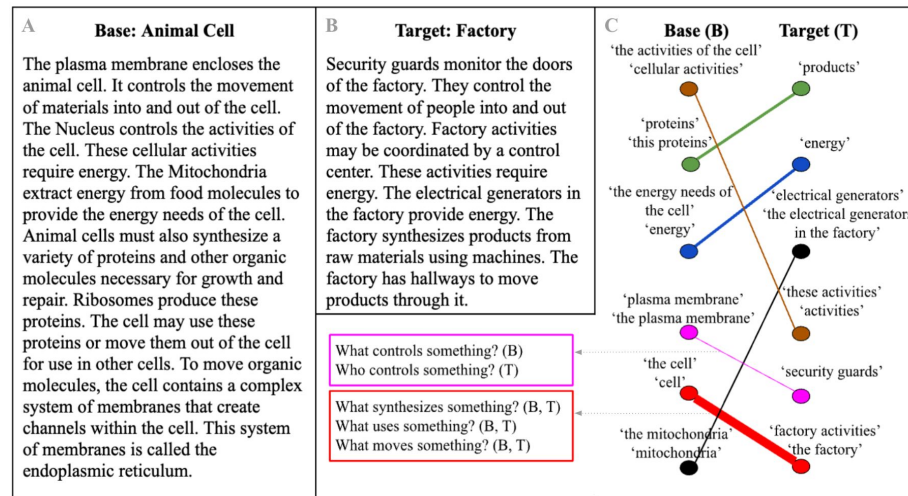


Life is a Circus and We are the Clowns: Automatically Finding Analogies between Situations and Processes

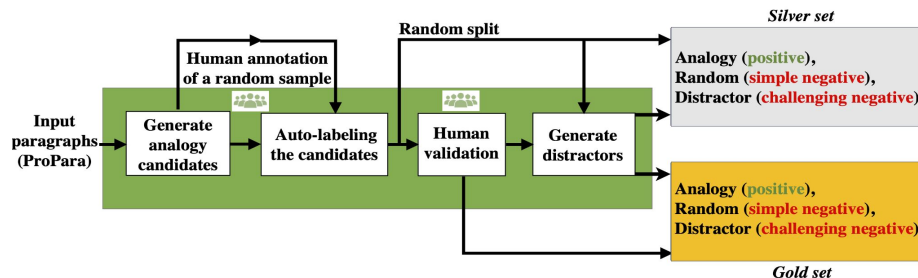
Oren Sultan, Dafna Shahaf



ParallelPARC: A Scalable Pipeline for Generating Natural-Language Analogies

Oren Sultan, Yonatan Bitton, Ron Yosef, Dafna Shahaf

Data generation pipeline



Dataset analogy example

Base	Target	Similar Relations
<p>Title: How does a solar panel work?</p> <p>Domain: Engineering</p> <p>Paragraph: solar energy powers an electric current within a solar panel. The photovoltaic cells within the panel convert the energy from the sun into electricity. The electrical wires then spread this power throughout the panel. The electric current is then used to power whatever the panel is connected to.</p>	<p>Title: How does photosynthesis occur?</p> <p>Domain: Natural Science</p> <p>Paragraph: Photosynthesis occurs when sunlight powers chemical reactions within the chloroplasts of a plant. The chloroplasts are able to transform the energy from the sunlight into usable energy for the plant. This energy is then used to produce nutrients for the plant, which are then distributed throughout the plant.</p>	<p>(solar energy, powers, electric current) (sunlight, powers, chemical reactions)</p> <p>(photovoltaic cells, convert, energy) (chloroplasts, transform, energy)</p> <p>(electrical wires, spread, power) (plants, distribute, nutrients)</p>

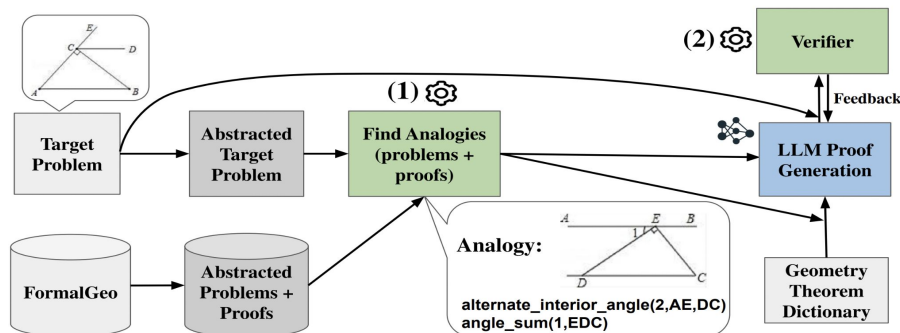
Towards Reliable Proof Generation with LLMs: A Neuro-Symbolic Approach

Oren Sultan, Eitan Stern, Dafna Shahaf

ACL 2026
submission



Neuro-symbolic approach



Dataset example

Problem:

Description: " $\angle ABC = 40^\circ$, $CD \parallel AB$, BC is perpendicular to AC . Find the measure of $\angle ECD$ "

Construction:
 $\text{Shape}(CA, AB, BC)$, $\text{Shape}(EC, CD)$...

Construction (extended):
 $\text{Shape}(AB, BC, CA)$, $\text{Shape}(BC, CA, AB)$...

Conditions:
 $\text{Equal}(\text{MeasureOfAngle}(ABC), 40)$,
 $\text{ParallelBetweenLine}(CD, AB)$...

Goal:
 $\text{Value}(\text{MeasureOfAngle}(ECD))$

Answer: 50

Proof:
 1) $\text{parallel_property_alternate_interior_angle}(1, CD, AB)$
 2) $\text{angle_addition}(1, ECD, DCB)$
 3) $\text{adjacent_complementary_angle}(1, ECB, BCA)$

Theorem Dictionary (GDL):

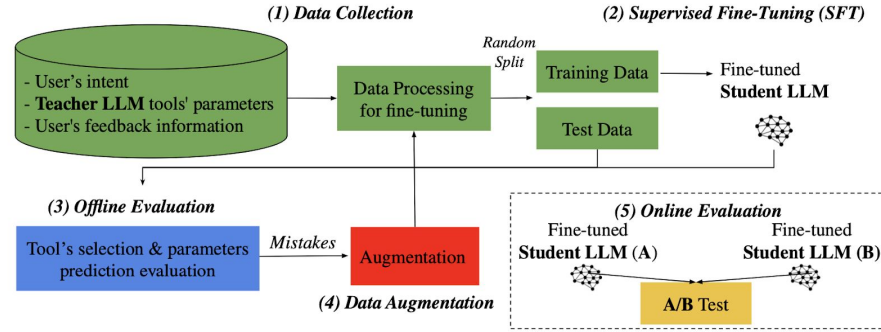
```
parallel_property_alterate_interior_angle(AB,CD):
{
  1: {
    premises:
    ParallelBetweenLine(AB,CD)&Line(AD),
    conclusions: Equal(MeasureOfAngle(BAD), ...)
  },
  2: { ... },
  ...
},
angle_addition(ABC, CBD): {
  1: { ... },
  ...
}
```



Visual Editing with LLM-based Tool Chaining: An Efficient Distillation Approach for Real-Time Applications

Oren Sultan, Alex Khasin, Guy Shiran, Asnat Greenstein-Messica, Dafna Shahaf

Distillation framework



Dataset example

Adjust

```
{
  "exposure": 0,
  "contrast": 10,
  "brightness": 10,
  "highlights": 20,
  "shadows": -10,
  "saturation": 15,
  "vibrance": 15,
  "temperature": 30,
  "tint": 10,
  "hue": 0,
  "bloom": 0,
  "sharpen": 0,
  "structure": 0,
  "linearOffset": 0
}
```

Selective adjust

```
{
  "red": {"saturation": 20, "luminance": 10},
  "orange": {"saturation": 30, "luminance": 20},
  "yellow": {"saturation": 40, "luminance": 30},
  "green": {"saturation": -20, "luminance": 0},
  "cyan": {"saturation": -20, "luminance": 0},
  "blue": {"saturation": 0, "luminance": 0}
}
```

Filter

```
{
  "name": "faded_HighNoon",
  "intensity": 40
}
```

"Golden hour"



CWM: An Open-Weights LLM for Research on Code Generation with World Models

Meta FAIR CodeGen Team, Oren Sultan

< trace_context_start >			
<pre>def count(s, t): n = 0 for c in s: n += int(c == t) return n count("strawberry", "r") # << START_OF_TRACE</pre>			
< frame_sep >			
< call_sep >	{ "s": "'strawberry'", "t": "'r'" }	< action_sep >	def count(s, t):
< frame_sep >			
< line_sep >	{ "s": " .", "t": " ." }	< action_sep >	n = 0
< frame_sep >			
< line_sep >	{ "s": " .", "t": " .", "n": " 0" }	< action_sep >	for c in s:
< frame_sep >			
< line_sep >	{ "s": " .", "t": " .", "n": " .", "c": "'s'" }	< action_sep >	n += int(c == t)
...			
< frame_sep >			
< return_sep >	< action_sep >	return n	< arg_sep > "3"
< frame_sep >			

LLMs versus the Halting Problem: Revisiting Program Termination Prediction

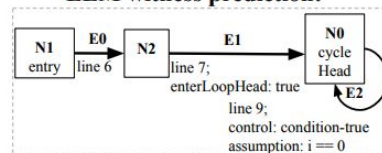
Oren Sultan, Jordi Armengol-Estapé, Pascal Kesseli, Julien Vanegue, Dafna Shahaf, Peter O'Hearn, Yossi Adi

C code example:

```
1: typedef enum {false,true} bool;
2:
3: extern int __VERIFIER_nondet_int(void);
4:
5: int main() {
6:     int i;
7:     i = __VERIFIER_nondet_int();
8:
9:     while (i >= -5 && i <= 5) {
10:        if (i > 0) {
11:            i = i-1;
12:        }
13:        if (i < 0) {
14:            i = i+1;
15:        }
16:    }
17:
18:    return 0;
19: }
```

 Verdict: Non-termination

LLM witness prediction:



UAutomizer (Witness Validator)