

## 6 APPENDIX

### 6.1 DATASET REFINEMENT

We analyze these trajectories and find that the MANGO dataset itself contains structural inconsistencies, which we categorize into *directional conflicts*, and *topological conflicts*.

**Original Dataset Conflicts.** We visualize the distribution of detected conflicts across all environments in Appendix Figure A1. All 18 games in the original MANGO dataset contain various types of conflicts, including many non-topological actions such as “pray” that do not correspond to spatial movement.

**Conflict-Free Dataset Creation.** To better evaluate the performance of our MapRepair system, we create a refined dataset that eliminates pre-existing conflicts and retains only topologically meaningful navigation actions. Our dataset refinement process follows a systematic 5-step pipeline:

1. **Action Filtering:** Filter the original dataset to retain only 14 topological movement actions (north, south, east, west, up, down, northeast, northwest, southeast, southwest, in, out, enter, exit), removing non-spatial actions like “pray”.
2. **Directional Conflict Resolution:** Remove duplicate edges when the same source node has multiple outgoing edges with identical direction labels. We preserve the edge with the minimum step count and remove all other duplicates.
3. **Topological Conflict Resolution:** Eliminate inconsistent reverse edges when bidirectional connectivity violates spatial symmetry. Edges that create directional mismatches in their reverse direction are removed.
4. **Reverse Edge Conflict Resolution:** Remove original edges that would cause directional conflicts when their corresponding reverse edges are added to maintain graph symmetry.
5. **Naming Conflict Resolution:** Eliminate edges that cause indirect conflicts through transitive spatial relationships. When different paths lead to inconsistent positional inferences for the same location, edges in the indirect paths are removed.
6. **Self-Loop Removal:** Delete all self-referential edges where a node points to itself, as these do not represent meaningful spatial transitions.

This refinement process removes a total of 160 edges, reducing the edge count from 1,673 to 1,513. The resulting conflict-free dataset (`data_fixed`) contains edges that represent valid topological relationships with clear spatial semantics.

**Topological Conflicts.** These occur when an edge violates expected spatial symmetry or consistency. For example, in dataset `zork2`, a topological conflict is triggered when the system observes `ledge in ravine -- down --> deep ford`, whereas the expected reverse transition from earlier was `deep ford -- north --> ledge in ravine`. Based on this prior observation, the forward edge should have been labeled `south`, not `down`.

**Directional Conflicts.** These arise when a node has multiple outgoing edges with the same direction label. For example, in dataset `zork2`, the node `carousel room` has two edges labeled “north”, pointing to both `marble hall` and `topyary`. This violates the uniqueness constraint of directional navigation in deterministic environments.

Appendix Table A1 presents the conflicts generated during the graph construction process across all games without the repair loop activated. The table shows the distribution of directional, topological, and naming conflicts for each game environment.

### 6.2 AN EXAMPLE OF REPAIRED GRAPH

In Figure. A2, we show the result of reconstructing the navigation graph using the game “advent” with the text description:

```
594         =====
595         ==>STEP NUM: 0
596         ==>ACT: Init
597         ==>OBSERVATION: Welcome to Adventure!
598         (Please type HELP for instructions and information.)
599
600
601         ADVENTURE
602         The Interactive Original
603         By Will Crowther (1976) and Don Woods (1977)
604         Reconstructed in three steps by:
605         Donald Ekman, David M. Baggett (1993) and Graham
606         Nelson (1994)
607         memoriam Stephen Bishop (1820?-1857):  GN
608
609         Release 9 / Serial number 060321 / Inform v6.31
610         Library 6/11 S
611
612         At End Of Road
613         You are standing at the end of a road before a small
614         brick building. Around you is a forest. A small
615         stream flows out of the building and down a gully.
616         =====
617         ==>STEP NUM: 1
618         ==>ACT: east
619         ==>OBSERVATION: Inside Building
620         You are inside a building, a well house for a large
621         spring.
622
623         There are some keys on the ground here.
624
625         There is tasty food here.
626
627         There is a shiny brass lamp nearby.
628
629         There is an empty bottle here.
630         =====
631         ==>STEP NUM: 2
632         ==>ACT: get all
633         ==>OBSERVATION: set of keys:  Taken.
634         tasty food:  Taken.
635         brass lantern:  Taken.
636         small bottle:  Taken.
637         stream:  The bottle is now full of water.
638         well house:  That's hardly portable.
639         spring:  That's hardly portable.
640         pair of 1 foot diameter sewer pipes:  That's hardly
641         portable.
642         =====
643         ==>STEP NUM: 3
644         ==>ACT: west
645         ==>OBSERVATION: At End Of Road
646         =====
647         ==>STEP NUM: 4
648         ==>ACT: south
649         ==>OBSERVATION: In A Valley
650         You are in a valley in the forest beside a stream
651         tumbling along a rocky bed.
```

```

648      =====
649      ==>STEP NUM: 5
650      ==>ACT: south
651      ==>OBSERVATION: At Slit In Streambed
652      At your feet all the water of the stream splashes into
653      a 2-inch slit in the rock. Downstream the streambed
654      is bare rock.
655      =====
656      ==>STEP NUM: 6
657      ==>ACT: south
658      ==>OBSERVATION: Outside Grate
659      You are in a 20-foot depression floored with bare
660      dirt. Set into the dirt is a strong steel grate
661      mounted in concrete. A dry streambed leads into the
662      depression.
663      =====
664      ==>STEP NUM: 7
665      ==>ACT: unlock grate with keys
666      ==>OBSERVATION: You unlock the steel grate.
667      =====
668      ==>STEP NUM: 8
669      ==>ACT: open grate
670      ==>OBSERVATION: You open the steel grate.
671      =====
672      ==>STEP NUM: 9
673      ==>ACT: down
674      ==>OBSERVATION: Below the Grate
675      You are in a small chamber beneath a 3x3 steel grate
676      to the surface. A low crawl over cobbles leads inward
677      to the west.
678
679      The grate stands open.
680      =====
681      ==>STEP NUM: 10
682      ==>ACT: west
683      ==>OBSERVATION: In Cobble Crawl
684      You are crawling over cobbles in a low passage. There
685      is a dim light at the east end of the passage.
686
687      There is a small wicker cage discarded nearby.
688      =====
689      ==>STEP NUM: 11
690      ==>ACT: get cage
691      ==>OBSERVATION: Taken.
692      =====
693      ==>STEP NUM: 12
694      ==>ACT: west
695      ==>OBSERVATION: Darkness
696      It is pitch dark, and you can't see a thing.
697      =====
698      ==>STEP NUM: 13
699      ==>ACT: light lamp
700      ==>OBSERVATION: You switch the brass lantern on.
701
702      In Debris Room
703      You are in a debris room filled with stuff washed in
704      from the surface. A low wide passage with cobbles
705      becomes plugged with mud and debris here, but an
706      awkward canyon leads upward and west.

```

702  
703 A note on the wall says, "Magic word XYZZY."  
704  
705 A three foot black rod with a rusty star on one end  
706 lies nearby.  
707 =====  
708 ==>STEP NUM: 14  
709 ==>ACT: west  
710 ==>OBSERVATION: Sloping E/W Canyon  
711 You are in an awkward sloping east/west canyon.  
712 =====  
713 ==>STEP NUM: 15  
714 ==>ACT: west  
715 ==>OBSERVATION: Orange River Chamber  
716 You are in a splendid chamber thirty feet high. The  
717 walls are frozen rivers of orange stone. An awkward  
718 canyon and a good passage exit from east and west  
719 sides of the chamber.  
720  
721 A cheerful little bird is sitting here singing.  
722 =====  
723 ==>STEP NUM: 16  
724 ==>ACT: get bird  
725 ==>OBSERVATION: You catch the bird in the wicker cage.  
726 =====  
727 ==>STEP NUM: 17  
728 ==>ACT: west  
729 ==>OBSERVATION: At Top of Small Pit  
730 At your feet is a small pit breathing traces of white  
731 mist. A west passage ends here except for a small  
732 crack leading on.  
733  
734 Rough stone steps lead down the pit.  
735 =====  
736 ==>STEP NUM: 18  
737 ==>ACT: down  
738 ==>OBSERVATION: In Hall of Mists  
739 You are at one end of a vast hall stretching forward  
740 out of sight to the west. There are openings to  
741 either side. Nearby, a wide stone staircase leads  
742 downward. The hall is filled with wisps of white mist  
743 swaying to and fro almost as if alive. A cold wind  
744 blows up the staircase. There is a passage at the top  
745 of a dome behind you.  
746  
747 Rough stone steps lead up the dome.  
748  
749 Your score has just gone up by twenty-five points.  
750  
751 =====  
752 ==>STEP NUM: 19  
753 ==>ACT: south  
754 ==>OBSERVATION: Low Room  
755 This is a low room with a crude note on the wall:  
  
"You won't get it up the steps".  
  
There is a large sparkling nugget of gold here!  
=====

```

756         ==>STEP NUM: 20
757         ==>ACT: get nugget
758         ==>OBSERVATION: Taken!
759
760 Your score has just gone up by seven points.
761
762         =====
763         ==>STEP NUM: 21
764         ==>ACT: north
765         ==>OBSERVATION: In Hall of Mists
766         =====
767         ==>STEP NUM: 22
768         ==>ACT: north
769         ==>OBSERVATION: Hall of the Mountain King
770         You are in the hall of the mountain king, with
771         passages off in all directions.
772
773         A huge green fierce snake bars the way!
774         =====
775         ==>STEP NUM: 23
776         ==>ACT: drop bird
777         ==>OBSERVATION: (The bird is released from the cage.)
778
779         The little bird attacks the green snake, and in an
780         astounding flurry drives the snake away.
781         =====
782         ==>STEP NUM: 24
783         ==>ACT: get bird
784         ==>OBSERVATION: You catch the bird in the wicker cage.
785         =====
786         ==>STEP NUM: 25
787         ==>ACT: north
788         ==>OBSERVATION: Low N/S Passage
789         You are in a low N/S passage at a hole in the floor.
790         The hole goes down to an E/W passage.
791
792         There are bars of silver here!
793         =====
794         ==>STEP NUM: 26
795         ==>ACT: drop keys
796         ==>OBSERVATION: Dropped.
797         =====
798         ==>STEP NUM: 27
799         ==>ACT: get silver
800         ==>OBSERVATION: Taken!
801
802 Your score has just gone up by seven points.
803
804         =====
805         ==>STEP NUM: 28
806         ==>ACT: north
807         ==>OBSERVATION: At "Y2"
808         You are in a large room, with a passage to the south,
809         a passage to the west, and a wall of broken rock to
810         the east. There is a large "Y2" on a rock in the
811         room's center.
812         =====
813         ==>STEP NUM: 29
814         ==>ACT: drop silver

```

```

810      ==>OBSERVATION: Safely deposited.
811      Standing inside the building, you decide to drop the
812      silver. [Your score has just gone up by five points.]
813      =====
814      ==>STEP NUM: 30
815      ==>ACT: drop nugget
816      ==>OBSERVATION: Safely deposited.
817      Your score has just gone up by five points.
818
819      =====
820      ==>STEP NUM: 31
821      ==>ACT: drop cage
822      ==>OBSERVATION: Dropped.
823      =====
824      ==>STEP NUM: 32
825      ==>ACT: drop food
826      ==>OBSERVATION: Dropped.
827      =====
828      ==>STEP NUM: 33
829      ==>ACT: south
830      ==>OBSERVATION: Low N/S Passage
831      Standing at 'y2', you decide to head south. As you
832      proceed, you notice a set of keys lying on the ground.
833      =====
834      ==>STEP NUM: 34
835      ==>ACT: south
836      ==>OBSERVATION: Hall of the Mountain King
837      =====
838      ==>STEP NUM: 35
839      ==>ACT: southwest
840      ==>OBSERVATION: Secret E/W Canyon Above Tight Canyon
841      You are in a secret canyon which here runs E/W. It
842      crosses over a very tight canyon 15 feet below. If
843      you go down you may not be able to get back up.
844      =====
845      ==>STEP NUM: 36
846      ==>ACT: west
847      ==>OBSERVATION: Secret Canyon
848      You are in a secret canyon which exits to the north
849      and east.
850
851      A huge green fierce dragon bars the way!
852      The dragon is sprawled out on the Persian rug!
853      =====
854      ==>STEP NUM: 37
855      ==>ACT: kill dragon
856      ==>OBSERVATION: With what? Your bare hands?
857      =====
858      ==>STEP NUM: 38
859      ==>ACT: yes
860      ==>OBSERVATION: Congratulations! You have
861      just vanquished a dragon with your bare hands!
862      (Unbelievable, isn't it?)
863      =====
864      ==>STEP NUM: 39
865      ==>ACT: get rug
866      ==>OBSERVATION: Taken!

```

Your score has just gone up by seven points.

=====

==>STEP NUM: 40

==>ACT: east

==>OBSERVATION: Secret E/W Canyon Above Tight Canyon

=====

==>STEP NUM: 41

==>ACT: down

==>OBSERVATION: N/S Canyon

You are at a wide place in a very tight N/S canyon.

=====

==>STEP NUM: 42

==>ACT: north

==>OBSERVATION: In Tall E/W Canyon

You are in a tall E/W canyon. A low tight crawl goes 3 feet north and seems to open up.

=====

==>STEP NUM: 43

==>ACT: north

==>OBSERVATION: In Swiss Cheese Room

You are in a room whose walls resemble swiss cheese. Obvious passages go west, east, ne, and nw. Part of the room is occupied by a large bedrock block.

=====

==>STEP NUM: 44

==>ACT: west

==>OBSERVATION: At East End of Twopit Room

You are at the east end of the twopit room. The floor here is littered with thin rock slabs, which make it easy to descend the pits. There is a path here bypassing the pits to connect passages from east and west. There are holes all over, but the only big one is on the wall directly over the west pit where you can't get to it.

=====

==>STEP NUM: 45

==>ACT: west

==>OBSERVATION: At West End of Twopit Room

You are at the west end of the twopit room. There is a large hole in the wall above the pit at this end of the room.

=====

==>STEP NUM: 46

==>ACT: down

==>OBSERVATION: In West Pit

You are at the bottom of the western pit in the twopit room. There is a large hole in the wall about 25 feet above you.

There is a tiny little plant in the pit, murmuring "Water, water, ..."

=====

==>STEP NUM: 47

==>ACT: pour water on plant

==>OBSERVATION: The plant spurts into furious growth for a few seconds.

There is a 12-foot-tall beanstalk stretching up out

918 of the pit, bellowing "Water!! Water!!"  
919 =====  
920 ==>STEP NUM: 48  
921 ==>ACT: up  
922 ==>OBSERVATION: At West End of Twopit Room  
923 The top of a 12-foot-tall beanstalk is poking out of  
924 the west pit.  
925 =====  
926 ==>STEP NUM: 49  
927 ==>ACT: east  
928 ==>OBSERVATION: At East End of Twopit Room  
929 The top of a 12-foot-tall beanstalk is poking out of  
930 the west pit.  
931 =====  
932 ==>STEP NUM: 50  
933 ==>ACT: east  
934 ==>OBSERVATION: In Swiss Cheese Room  
935 =====  
936 ==>STEP NUM: 51  
937 ==>ACT: north  
938 ==>OBSERVATION: Misty Cavern  
939 From the swiss cheese room, you head northwest and  
940 find yourself in the oriental room. Ancient oriental  
941 cave drawings cover the walls. A gently sloping  
942 passage leads upward to the north, another passage  
943 leads southeast, and a hands and knees crawl leads  
944 west. You can see a ming vase here.  
945 =====  
946 ==>STEP NUM: 52  
947 ==>ACT: drop all  
948 ==>OBSERVATION: Persian rug: Dropped.  
949 You find yourself in the alcove. With a decisive  
950 'drop all,' you relinquish your burdens: small  
951 bottle: Dropped. brass lantern: Dropped.  
952 Your score has just gone down by five points.  
953 =====  
954 ==>STEP NUM: 53  
955 ==>ACT: east  
956 ==>OBSERVATION: Plover Room  
957 You're in a small chamber lit by an eerie green light.  
958 An extremely narrow tunnel exits to the west. A dark  
959 corridor leads northeast.  
960 There is an emerald here the size of a plover's egg!  
961 =====  
962 ==>STEP NUM: 54  
963 ==>ACT: get emerald  
964 ==>OBSERVATION: Taken!  
965 Your score has just gone up by seven points.  
966 =====  
967 ==>STEP NUM: 55  
968 ==>ACT: west  
969 ==>OBSERVATION: Alcove  
970 Your lamp is here, gleaming brightly.  
971



972           The Persian rug is spread out on the floor here.  
973  
974           You can also see a small bottle (which is empty) here.  
975           =====  
976           ==>STEP NUM: 56  
977           ==>ACT: get all  
978           ==>OBSERVATION: brass lantern: Taken.  
979           small bottle: Taken.  
980           Persian rug: Taken!  
981   Your score has just gone up by five points.  
982  
983           =====  
984           ==>STEP NUM: 57  
985           ==>ACT: south  
986           ==>OBSERVATION: Oriental Room  
987           Standing in the misty cavern, you decide to head  
988           south. As you proceed, you notice a ming vase resting  
989           quietly in the shadows.  
990           =====  
991           ==>STEP NUM: 58  
992           ==>ACT: get vase  
993           ==>OBSERVATION: Taken!  
994   Your score has just gone up by seven points.  
995  
996           =====  
997           ==>STEP NUM: 59  
998           ==>ACT: southeast  
999           ==>OBSERVATION: In Swiss Cheese Room  
1000           =====  
1001           ==>STEP NUM: 60  
1002           ==>ACT: east  
1003           ==>OBSERVATION: In Soft Room  
1004           You are in the soft room. The walls are covered with  
1005           heavy curtains, the floor with a thick pile carpet.  
1006           Moss covers the ceiling.  
1007           A small velvet pillow lies on the floor.  
1008           =====  
1009           ==>STEP NUM: 61  
1010           ==>ACT: get pillow  
1011           ==>OBSERVATION: Taken.  
1012           =====  
1013           ==>STEP NUM: 62  
1014           ==>ACT: west  
1015           ==>OBSERVATION: In Swiss Cheese Room  
1016           =====  
1017           ==>STEP NUM: 63  
1018           ==>ACT: northeast  
1019           ==>OBSERVATION: Bedquilt  
1020           You are in bedquilt, a long east/west passage with  
1021           holes everywhere. To explore at random select north,  
1022           south, up, or down.  
1023           =====  
1024           ==>STEP NUM: 64  
1025           ==>ACT: east  
1026           ==>OBSERVATION: At Complex Junction  
1027           You are at a complex junction. A low hands and knees

1026 passage from the north joins a higher crawl from the  
1027 east to make a walking passage going west. There is  
1028 also a large room above. The air is damp here.  
1029 =====  
1030 ==>STEP NUM: 65  
1031 ==>ACT: up  
1032 ==>OBSERVATION: In Dusty Rock Room  
1033 You are in a large room full of dusty rocks. There is  
1034 a big hole in the floor. There are cracks everywhere,  
1035 and a passage leading east.  
1036 =====  
1037 ==>STEP NUM: 66  
1038 ==>ACT: east  
1039 ==>OBSERVATION: Dirty Passage  
1040 You are in a dirty broken passage. To the east is a  
1041 crawl. To the west is a large passage. Above you is  
1042 a hole to another passage.  
1043 =====  
1044 ==>STEP NUM: 67  
1045 ==>ACT: up  
1046 ==>OBSERVATION: Low N/S Passage  
1047  
1048 You can see a set of keys here.  
1049 =====  
1050 ==>STEP NUM: 68  
1051 ==>ACT: north  
1052 ==>OBSERVATION: At "Y2"  
1053 =====  
1054 ==>STEP NUM: 69  
1055 ==>ACT: plugh  
1056 ==>OBSERVATION: Inside Building  
1057 You are inside a building, a well house for a large  
1058 spring.  
1059  
1060 You can see some tasty food, a wicker cage (which  
1061 is closed) (in which is a little bird), a large gold  
1062 nugget and some bars of silver here.  
1063 =====  
1064 ==>STEP NUM: 70  
1065 ==>ACT: drop pillow  
1066 ==>OBSERVATION: Dropped.  
1067 =====

1068 Please use the html file in the folder for a better 3D navigation experience.  
1069  
1070  
1071  
1072  
1073  
1074  
1075  
1076  
1077  
1078  
1079

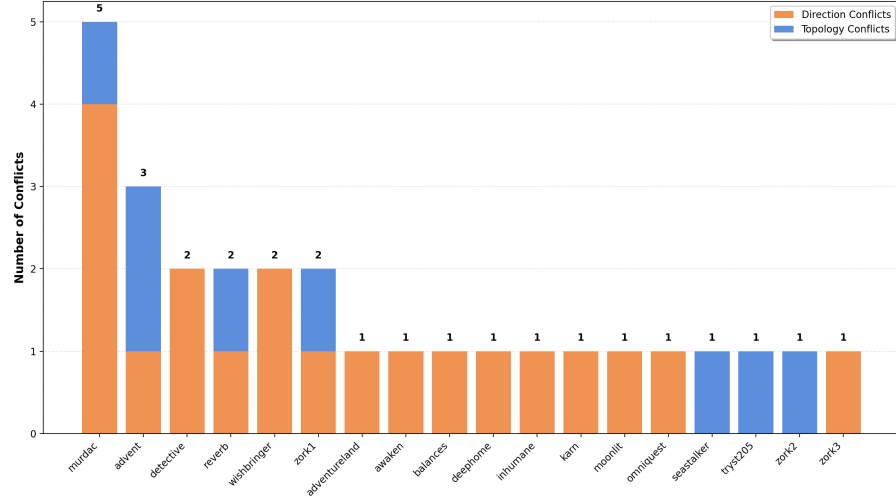


Figure A1: Structural conflict distribution in MANGO environments. Blue segments represent topological conflicts; orange segments represent directional conflicts. Naming conflicts are not observed.

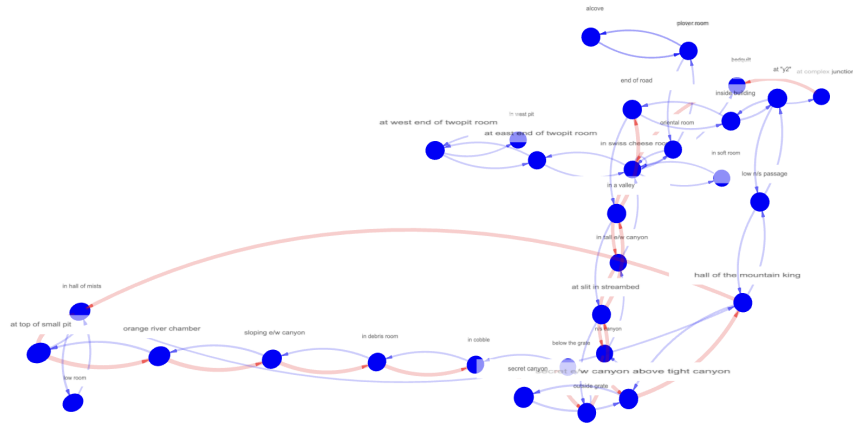


Figure A2: An example of result reconstructed and repaired using LLMRepair

Table A1: Game Graph Analysis Results

Game Name	Nodes	Edges	Direction Conflicts	Topology Conflicts	Naming Conflicts	Total Conflicts
905	6	10	0	0	0	0
advent	33	69	1	0	0	1
adventureland	21	52	9	0	0	9
afflicted	12	26	3	0	0	3
anchor	23	46	0	0	0	0
awaken	15	34	3	0	0	3
balances	10	22	4	0	0	4
ballyhoo	19	42	3	0	0	3
curses	14	32	2	0	0	2
cutthroat	26	68	15	1	72	88
deephomes	28	54	1	0	0	1
detective	27	54	3	0	8	11
dragon	26	52	0	0	0	0
enchanter	24	52	3	0	0	3
enter	14	28	1	0	0	1
gold	14	27	3	0	0	3
hhgg	8	12	0	0	0	0
hollywood	14	28	2	0	0	2
huntedark	8	12	0	0	0	0
infidel	25	50	0	0	0	0
inhumane	30	65	4	1	8	13
jewel	19	39	4	0	0	4
karn	17	38	3	0	0	3
library	8	16	2	0	0	2
loose	12	22	0	0	0	0
lostpig	6	10	0	0	0	0
ludicorp	23	44	0	0	0	0
lurking	14	26	0	0	0	0
moonlit	6	10	0	0	0	0
murdac	33	71	12	1	24	37
night	21	50	6	0	0	6
omniquest	29	60	0	0	0	0
partyfoul	6	14	2	0	0	2
pentari	16	34	3	0	0	3
planetfall	24	48	1	0	8	9
plundered	21	40	1	0	0	1
reverb	16	37	7	1	0	8
seastalker	18	34	1	0	0	1
sherlock	19	45	5	0	0	5
snacktime	4	8	1	0	0	1
sorcerer	26	51	3	0	0	3
spellbrkr	18	33	0	0	0	0
spirit	21	44	2	0	0	2
temple	20	40	3	0	0	3
trinity	14	26	1	0	0	1
tryst205	8	14	2	0	0	2
wishbringer	26	54	2	0	0	2
yomomma	9	22	0	0	0	0
zenon	14	26	1	0	0	1
zork1	19	44	6	0	0	6
zork2	26	59	7	0	0	7
zork3	24	53	4	0	0	4
ztuu	18	36	2	0	0	2

Table A2: Game Graph Analysis Results with Repair Methods

Game Name	Total Conflicts	Edge-Impact Ranking Only			Version Control Only			Version Control + Edge-Impact Ranking (Ours)			Baseline		
		Avg Loops	Repaired (#)	Correct (#)	Avg Loops	Repaired (#)	Correct (#)	Avg Loops	Repaired (#)	Correct (#)	Avg Loops	Repaired (#)	Correct (#)
905	0	-	-	-	-	-	-	-	-	-	-	-	-
advent	1	6.0	1	0	7.0	1	1	8.0	1	1	2.0	1	0
adventureland	9	6.67	8	4	7.78	6	3	8.44	7	4	9.56	2	0
afflicted	3	6.0	3	1	7.33	2	1	8.0	2	1	9.67	1	0
anchor	0	-	-	-	-	-	-	-	-	-	-	-	-
awaken	3	6.33	2	1	7.0	2	1	8.33	2	1	9.33	2	0
balances	4	6.25	3	1	7.25	3	2	8.0	3	2	9.5	1	0
ballyhoo	3	6.67	2	1	7.67	2	1	8.33	2	1	9.67	1	0
curse	2	6.0	2	1	7.0	2	1	8.5	2	1	9.5	1	0
cutthroat	88	6.36	58	26	7.64	48	22	8.45	52	29	9.55	3	0
deephom	1	6.0	1	0	7.0	1	1	8.0	1	1	10.0	1	0
detective	11	6.55	7	3	7.64	6	3	8.36	6	3	9.45	2	1
dragon	0	-	-	-	-	-	-	-	-	-	-	-	-
enchanter	3	6.33	2	1	7.33	2	1	8.0	2	1	9.67	1	0
enter	1	6.0	1	0	7.0	1	1	8.0	1	1	10.0	1	0
gold	3	6.67	2	1	7.67	2	1	8.33	2	1	9.33	1	0
hgg	0	-	-	-	-	-	-	-	-	-	-	-	-
hollywood	2	6.5	2	1	7.5	2	1	8.0	2	1	9.5	1	0
hundred	0	-	-	-	-	-	-	-	-	-	-	-	-
infidel	0	-	-	-	-	-	-	-	-	-	-	-	-
inhumane	13	6.46	8	4	7.69	7	3	8.31	7	4	9.54	2	1
jewel	4	6.5	3	1	7.5	3	2	8.25	3	2	9.5	1	0
karn	3	6.33	2	1	7.33	2	1	8.0	2	1	9.67	1	0
library	2	6.0	2	1	7.0	2	1	8.5	2	1	9.5	1	0
loose	0	-	-	-	-	-	-	-	-	-	-	-	-
lostpig	0	-	-	-	-	-	-	-	-	-	-	-	-
ludicorp	0	-	-	-	-	-	-	-	-	-	-	-	-
lurking	0	-	-	-	-	-	-	-	-	-	-	-	-
moonlit	0	-	-	-	-	-	-	-	-	-	-	-	-
murder	37	6.46	24	11	7.57	19	9	8.32	21	12	9.51	3	0
night	6	6.5	4	2	7.67	3	2	8.33	4	2	9.5	2	0
omniquest	0	-	-	-	-	-	-	-	-	-	-	-	-
partyfoul	2	6.5	2	1	7.5	2	1	8.0	2	1	9.5	1	0
pentari	3	6.67	2	1	7.67	2	1	8.33	2	1	9.33	1	0
planetfall	9	6.44	6	3	7.56	5	2	8.33	5	3	9.44	2	0
plundered	1	6.0	1	0	7.0	1	1	8.0	1	1	10.0	1	0
reverb	8	6.5	5	2	7.75	4	2	8.38	4	2	9.5	2	0
seastalker	1	6.0	1	0	7.0	1	1	8.0	1	1	10.0	1	0
sherlock	5	6.4	3	1	7.6	3	2	8.4	3	2	9.6	2	1
snacktime	1	6.0	1	0	7.0	1	1	8.0	1	1	10.0	1	0
sorcerer	3	6.33	2	1	7.33	2	1	8.0	2	1	9.67	1	0
spellbkr	0	-	-	-	-	-	-	-	-	-	-	-	-
spirit	2	6.5	2	1	7.5	2	1	8.0	2	1	9.5	1	0
temple	3	6.67	2	1	7.67	2	1	8.33	2	1	9.33	1	0
trinity	1	6.0	1	0	7.0	1	1	8.0	1	1	10.0	1	0
tryst205	2	6.5	2	1	7.5	2	1	8.0	2	1	9.5	1	0
wishbringer	2	6.5	2	1	7.5	2	1	8.0	2	1	9.5	1	0
yomomma	0	-	-	-	-	-	-	-	-	-	-	-	-
zenon	1	6.0	1	0	7.0	1	1	8.0	1	1	10.0	1	0
zork1	6	6.5	4	2	7.67	3	2	8.33	3	2	9.5	2	0
zork2	7	6.43	4	2	7.71	4	2	8.29	4	2	9.43	2	0
zork3	4	6.5	3	1	7.5	3	2	8.25	3	2	9.5	1	0
zruu	2	6.5	2	1	7.5	2	1	8.0	2	1	9.5	1	0

Table A3: Game Graph Analysis Results Comparison - Version Control + Edge-Impact Ranking

Game Name	Total Conflicts	GPT-4o			GPT-4.1			GPT-4o-mini		
		Avg Loops	Repaired (#)	Correct (#)	Avg Loops	Repaired (#)	Correct (#)	Avg Loops	Repaired (#)	Correct (#)
905	0	-	-	-	-	-	-	-	-	-
advent	1	8.00	1	1	8.00	1	1	9.00	1	1
adventureland	9	8.44	7	4	8.22	7	5	9.11	6	3
afflicted	3	8.00	2	1	7.67	2	1	9.00	2	1
anchor	0	-	-	-	-	-	-	-	-	-
awaken	3	8.33	2	1	8.00	2	1	9.00	2	1
balances	4	8.00	3	2	7.75	3	2	9.00	3	2
ballyhoo	3	8.33	2	1	8.67	2	1	9.00	2	1
curses	2	8.50	2	1	8.00	2	1	9.00	2	1
cutthroat	88	8.45	52	29	8.52	54	28	9.18	47	26
deephome	1	8.00	1	1	7.00	1	1	9.00	1	1
detective	11	8.36	6	3	8.18	6	4	9.09	5	2
dragon	0	-	-	-	-	-	-	-	-	-
enchanter	3	8.00	2	1	7.67	2	1	9.00	2	1
enter	1	8.00	1	1	7.00	1	1	9.00	1	1
gold	3	8.33	2	1	8.67	2	1	9.00	2	1
hhgg	0	-	-	-	-	-	-	-	-	-
hollywood	2	8.00	2	1	8.00	2	1	9.00	2	1
huntdark	0	-	-	-	-	-	-	-	-	-
infidel	0	-	-	-	-	-	-	-	-	-
inhumane	13	8.31	7	4	8.15	7	4	9.00	6	3
jewel	4	8.25	3	2	8.00	3	2	9.00	3	2
karn	3	8.00	2	1	8.33	2	1	9.00	2	1
library	2	8.50	2	1	8.00	2	1	9.00	2	1
loose	0	-	-	-	-	-	-	-	-	-
lostpig	0	-	-	-	-	-	-	-	-	-
ludicorp	0	-	-	-	-	-	-	-	-	-
lurking	0	-	-	-	-	-	-	-	-	-
moonlit	0	-	-	-	-	-	-	-	-	-
murdac	37	8.32	21	12	8.46	22	11	9.03	19	10
night	6	8.33	4	2	8.17	4	2	9.00	3	2
omniquest	0	-	-	-	-	-	-	-	-	-
partyfoul	2	8.00	2	1	7.50	2	1	9.00	2	1
pentari	3	8.33	2	1	8.00	2	1	9.00	2	1
planetfall	9	8.33	5	3	8.56	5	2	9.00	4	2
plundered	1	8.00	1	1	7.00	1	1	9.00	1	1
reverb	8	8.38	4	2	8.25	4	3	9.13	3	2
seastalker	1	8.00	1	1	7.00	1	1	9.00	1	1
sherlock	5	8.40	3	2	8.20	3	2	9.20	2	1
snacktime	1	8.00	1	1	7.00	1	1	9.00	1	1
sorcerer	3	8.00	2	1	7.67	2	1	9.00	2	1
spellbrkr	0	-	-	-	-	-	-	-	-	-
spirit	2	8.00	2	1	8.00	2	1	9.00	2	1
temple	3	8.33	2	1	8.00	2	1	9.00	2	1
trinity	1	8.00	1	1	7.00	1	1	9.00	1	1
tryst205	2	8.00	2	1	8.00	2	1	9.00	2	1
wishbringer	2	8.00	2	1	7.50	2	1	9.00	2	1
yomomma	0	-	-	-	-	-	-	-	-	-
zenon	1	8.00	1	1	7.00	1	1	9.00	1	1
zork1	6	8.33	3	2	8.17	3	2	9.00	3	2
zork2	7	8.29	4	2	8.43	4	2	9.00	4	2
zork3	4	8.25	3	2	8.00	3	2	9.00	3	2
ztuu	2	8.00	2	1	7.50	2	1	9.00	2	1