

The Snake: Experience and Research*

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Abstract

This paper talks about the author's experiences with the Snake; how it has fundamentally changed the way he works and made him more "productive". It gives insights into how the Snake can be controlled, and how to score big-time using the Snake. The paper also formalizes the Snake control theory. It describes results of a user study, in which users with no prior Snake experience played with the author's Snake. The paper ends with a description of the open research issues concerning the Snake.

1 Introduction

I was introduced to the Snake by a friend of mine, a big Snake fan. This was when he stayed overnight at my place, and showed me his Snake. Before then I had only heard about Snaking and did not have any first hand experience with it. Since then I have been addicted to it, and have been religiously practicing the art of growing the Snake, shrinking it, and then regrowing it.

I describe my experiences with the Snake in Section 2. Section 3 gives a formal specification of the Snake movements. Results of a user study are discussed in Section 4. Open research problems are specified in Section 5, and I conclude in Section 6.

2 Experience with the Snake

My experience with the Snake has been very satisfying. My Snake has never let me down. It has performed on all important occasions. There have been no "demo syndrome"¹, or "embarrassing pauses" like with garbage collection.

*Since my experience with the Snake pre-dated my realization the intriguing research issues involved, this paper is titled "Experience and Research" instead of "Research and Experience", the more commonly used form in computer science documents.

¹A program failing exactly when it is being demonstrated

I am currently using the second version of the Snake. Not that I had problems with the first version, but I happened to run into the newer version and found it more appealing; it has more capabilities as far going into holes is concerned. I realize that most people who use the Snake live their entire life with the same one. This can be attributed to the stigma in the Snake user community regarding exploration of other people's Snakes.

Controlling the Snake is somewhat of an art rather than a science. Nevertheless, there are general guidelines I would like to delve into that would help the novice users. The most important thing to remember is making the right moves at the right time. If either the move or the timing is incorrect, a grown-up Snake can go back to zero in no time at all. Predetermined moves, when possible, can certainly help. But on most occasions targets spring up at the least likely times and places; its the presence of mind along with past experience that comes to one's aid.

A few lines about the size vs utility trade-offs of the Snake. The speed of the Snake does not change with size, so a small Snake is more flexible than a big one. A small Snake can go into the holes easily, merrily play around in the large empty space, and come out right when it wants to. Additionally, it is generally uneasy to move around with a big Snake. So my advice to budding "players" is two-fold. First, keep the Snake as small as possible till late in the game. Second, keep eyes open for quality targets; one excellent target is more worth than five ordinary ones, and at the same time, less number of targets helps keep the Snake size down.

Early on, one of the issues I had with the Snake is that once it starts going for a target, it is hard to pull it back. Now I have come to accept this behavior, and even appreciate it to some extent. After all, in a world where most urges are libido-driven, why should the Snake's behavior be any different. However, there are certain times when some targets come across in places that cannot be called anything short of traps (because of various extraneous factors). The best strategy then is to cajole the Snake into turning around (not stopping) slowly and as-

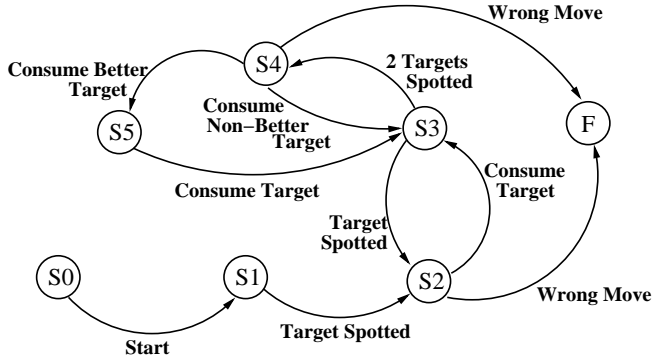


Figure 1: A Simplified Model for the Snake.

sure it that you'll come back to the same target later. If you do that, make sure you keep your promise; otherwise, the Snake can get very angry and refuse to grow again.

If, like me, you find yourself playing with the Snake in your office, you have two options. Either try to convince your officemates that they should also play with you. Or, if they find playing with the Snake inside the office inappropriate, play such that they do not catch you playing with the Snake. Unfortunately, I have had to adopt the latter strategy. Unfortunately again, it is not working, mainly because I spend way too much time with the Snake for them not to notice. The best course of action is the former option. Be cogent when you argue in favor of the Snake, give them this paper to read, show them your Snake, and if it helps, even offer them your Snake to play with. If you are in Sieg 433, one of these techniques should work for you.

I would like to end this section with stating that one should not be hindered by any initial failures. You are most likely to get better with each passing day (or night), unless you have some inherent disability. My own current score, for interested readers, is 517.

3 Formal Model for the Snake

In this section I describe a simplified model that can be used to describe the movements of the Snake. To the best of my knowledge this is the first model of the Snake in the computer science literature.

Figure 1 shows a non-deterministic state machine [1] for the Snake. The model, though highly simplified², can be used to show many useful properties of the Snake. Now,

²I believe that a complete model for the Snake movements will be P-Space complete. I plan to show this in a future paper.

I specify the semantics of each state.

- *S0*: It is the start state. The player enters this state as soon as he³ gets ready to play with his Snake.
- *S1*: The transition from *S0* to *S1* is to model the time a player needs to check whether his equipment is in fine and working state. In real life, there might not be any such time if an attractive target appears instantly. Also hidden in the model is the assumption that appearance of a target cannot make a Snaker start Snaking, he has to be ready to play to be lured.
- *S2*: A Snaker goes to *S2* when he spots a target his Snake would be interested in.
- *S3*: The Snaker has to use utmost care when going from *S2* to *S3*, the state where he actually consumes (the word is used for lack of better alternative) the target. Consuming the target is the thing a Snaker enjoys most and goes to so much trouble for. As can be seen from the model, this is a very precarious journey. One wrong move can land the player into the finish state *F*, Snake's recovery from which is not possible. The Snake gets bigger while consuming the target.
- *S4*: The Snaker stays in the *S2*-*S3* loop until he spots 2 targets at the same time, at which point he enters *S4*. This state is where the non-determinism creeps in. The Snaker now has to decide whether to go after what he thinks is the better target. We assume that the better target is harder to get, and stays for a short period of time. The non-better (there is no such thing as a bad/worse target) target is both easier to get, and stays longer. Skilled Snakers can consume both targets, the better followed by the non-better. However, since getting the better target is harder by definition, it is easy to land up in *F* and not get the non-better target too⁴. If you feel confident enough, you should go for the better target first (remember what I said about quality earlier on).
- *S5*: This is the most enjoyable state, which depicts the consumption of the better target. The joy lies not only in the act of consumption, but also the confidence boost because of having scored with the better target.
- *F*: It all ends in this state, where the Snaker lands because of a single wrong move. The Snake deflates

³Given that most Snakers are men, I'll place semantics over etiquette by using masculine pronouns.

⁴If you are not very experienced, remember a bird in hand is worth two in the bush.

and goes back to default size. But the Snaker should not lose heart, and start Snaking again to grow it.

4 User Study

This section reports the results from a small user study. The aim of the study was to observe how new users react to the Snake. The subjects in this study were a female T and a Male S (identities have been held back for anonymity reasons). Both users were invited to play with my Snake. The times for the study were chosen such that there would be no one else in the office, lest presence of other people modify their natural reaction. Both subjects were made to sit close to me, but on a separate chair for ergonomic reasons.

The subject T was totally fascinated by my Snake and claimed that she had never seen anything like it before. She preferred to play with it slowly, with me providing instructions along the way. She managed to grow it to a sizeable length, given that this was her first hands-on experience with it, before she made a wrong move and the Snake shrank. The study ended when a phone call reported that her husband was waiting for her outside the office.

I was surprised to hear that the subject S had never even heard of the Snake. He started out very slowly, but soon increased the speed threefold. While he was also riveted to my Snake like T, he did not manage to grow it as even half as big as T. But in the end he promised me that he would soon start playing with his own Snake.

Upshot of this study is that humans take to Snaking as naturally as fishes take to water. In the interest of space, I would not speculate on explaining the difference in behavior on a sexual basis. The readers are encouraged to draw their own conclusions, and conduct their own user studies.

5 Open Research Problems

With this paper, I hope to encourage capable computer scientists not only to take up Snaking but also apply themselves to the research issues involved, thus opening up a whole new field of computer science research. I identify three major open research questions.

The biggest open research problem is effective ways to approach a target when the Snake is already big. I am not sure what the right strategy out of the two options is. The first is accosting openly: you reach faster but might block your progress towards future targets. The second strategy is approaching surreptitiously along the walls of

the room: this is slower but maybe more effective with respect to future prospects.

Being always prepared for better targets is an important gaming strategy. Some statistical model for when these better targets appear would make the Snakers' life easy and increase the scoring rate with the better targets.

Everyone is not born with a silver spoon in their mouth. Similarly, everyone is not born with access to a Snake. I believe that Snaking is an activity all human beings should be able to cherish, and there should be no Snaking divide on this planet. Vigorous multi-faceted research that would make access to the Snake universal is the need of the hour.

6 Conclusions

In this paper I have described my long-standing experience with the Snake, and provided insightful heuristics on how to grow a Snake effectively. An important contribution of this paper is the first formal model to describe Snaking. I hope that this would fuel further research in Snaking. Result of a user study prove that Snaking is a natural activity for human beings of both sexes. I have also identified three major open research questions concerning the art of Snaking.

I would like to end this paper with an appeal to the computer science community to take up Snaking research. I would also exhort the readers to take up Snaking actively. The attached disclaimer being that it is addictive, and, when not done within limits, has the potential to jeopardize the Snaker's married life. People with no Snakes of their own should try borrowing from their friends. If that fails try getting your own Snake from <http://www.nokia.com/games/snake2.html>.

Acknowledgements

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References

- [1] Michael Sipser. Introduction to the Theory of Computation. PWS Publishing, 1997.