

# Real Currency Economies: Using Real Money in Virtual Worlds

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**Abstract** - *Continuing improvements in computing power and high-speed Internet access have led to an explosion in the popularity of multi-player online environments. In addition to providing a new form of entertainment, several of these environments have proven useful for educational activities. Specifically, the Second Life environment, which provides a physics and graphics engine for anyone to display 3D content, has received significant attention within the academic community. The University of Tennessee at Chattanooga recently used Second Life as a platform for a senior capstone project. We describe our experiences and evaluate Second Life as a virtual environment. The evaluation includes a discussion on several unique aspects of Second Life. Specifically, player ownership of virtual property and the express provision for transfers between real currency and the virtual Linden\$; this raises some interesting unresolved financial and legal questions for future projects.*

**Keywords:** Education, virtual worlds, Real-currency economy, games

## 1 Introduction

Second Life ([www.secondlife.com](http://www.secondlife.com)) is a 3D virtual environment created by Linden Labs. The Second Life environment resists the label “game” because there are no officially sanctioned goals to pursue and because Linden Labs provides relatively little content – the overwhelming majority of items that avatars can interact with are player-created. Linden Labs recognizes that player-created objects are owned by the player (most online games have terms of service recognizing that the game creator owns all items in the virtual world). Another unusual (though not unique) feature is that Linden Labs supports and advertises that its in-game currency Linden\$ can be easily converted into US\$. These aspects combine to create a thriving marketplace in virtual goods; Shop On Rez (<http://shop.onrez.com>) is one of several sites outside of Linden Lab’s direct control offering many thousands of items for sale. The ability to construct a realistic multi-agent environment, without the need to write code implementing physics or network communications, has attracted attention from several non-profit users as well as many educational institutions.

The New Media Consortium recently released the results of a survey [1] distributed among academic users of Second Life that presented a snapshot of the educational user community within Second Life. Educators were very upbeat about the potential of Second Life; 87% rated its potential for scenario-based training as 4 or 5 on a 5 point scale. Over 70% felt it had high potential for distance learning, with 60% enthusiastic about its potential for full courses to be taught in Second Life. The survey targeted educators already using Second Life, and is not a sampling of all educators; however, the survey clearly shows that educators enthusiastic about Second Life have retained their enthusiasm.

In addition to its survey, the New Media Consortium has constructed a virtual university [2]. Additionally, institutions like Stanford University are using Second Life to present a cyber facade to material such as building a digital archive of their Lynn Hershman Leeson Collection [3]. Numerous other schools have experimented with establishing a virtual presence in Second Life. The University of Tennessee at Chattanooga (UTC) recently assigned Second Life as a senior project; the team created an interesting virtual space with relatively little difficulty.

The close correspondence between Linden\$ and US\$ has potentially negative effects as well. Online Game developers frequently reserve the right to suspend player accounts. One banned Second Life player, Marc Bragg, filed suit against Linden Labs alleging they had improperly seized virtual assets worth thousands of dollars [4]. The recent failure of Ginko, a virtual bank for Linden\$, attracted media attention precisely because the accounts had “real” monetary value. Similarly, the US ban on Internet gambling may be the reason that Linden Labs recently banned gambling in Second Life.

This paper summarizes UTC’s experiences with Second Life as a learning environment. We consider some of the unusual and unique features of Second Life as well as the limitations of the platform. We then discuss some of the implications of the increasing linkage between virtual currencies and real currencies.

## 2 UTC Second Life Experience

The University of Tennessee at Chattanooga’s first foray into Second Life was a senior project during the Spring 2007 semester. The project team was tasked to build a virtual

UTC, including an amphitheater for presentations, a conference room for less formal interaction, and a setup to present PowerPoint slides and video on UTC facilities. The team succeeded in meeting its goals. It was easy to use a combination of new construction and purchased objects to create a suitable virtual environment. The team was able to master scripting and building skills quickly enough to use them appropriately in the project. The team demonstrated display screens which could step through PowerPoint slides as well as streaming audio and video. In all, it was an interesting and successful senior project. Figure 1 shows an overview of the project area.

Once the senior project was completed, one of the students continued work in Second Life, and created some virtual exhibits including an interactive state machine to supplement a traditionally taught course in Digital Logic Design. Figure 2 shows the resulting state machine. The exhibit made it much easier to explain the behavioral differences between Mealy and Moore state machines, and gave a simulation of the state machine behavior, without revealing the exact logic circuit (which was a prelab assignment). The student also designed a simple scripting exercise targeted at novices potentially interested in pursuing a computer science degree. The two groups gave enthusiastic responses to a survey; 83% of the respondents in the digital logic course recommended that similar exhibits be prepared

for that or other UTC courses. Further details of the exhibits and survey results are at [5].

The biggest challenge the senior project team had to overcome was a lack of land. Linden Labs supported our initial efforts with a land grant, but the size was not large enough to accommodate our original vision of a virtual Computer Science department modeled on the real building. The team had to live within Prim constraints as well (the number of primitive graphics objects is tied to the available land area). The expiration of the land grant meant that the later exhibits were shown on a small, non-UTC-branded lot. Second Life's normal charge for a private island is a one-time fee of \$1675 and a monthly charge of \$295 (educational institutions are eligible to receive a 50% discount). The land fees (particularly the monthly maintenance fee) means that small schools like UTC are dependent upon external funding to have an ongoing presence in Second Life. The expense of land ownership greatly influences the environment of Second Life. For example, Figure 3, a different view of UTC's initial project, shows the crowding caused by several adjacent neighbors building ambitious projects on limited land areas. The expense of land ownership motivates land owners to attempt to recoup their investment; thus, shopping malls, seedy night clubs, gambling casinos (before they were disallowed), and advertisements fill the world of Second Life.

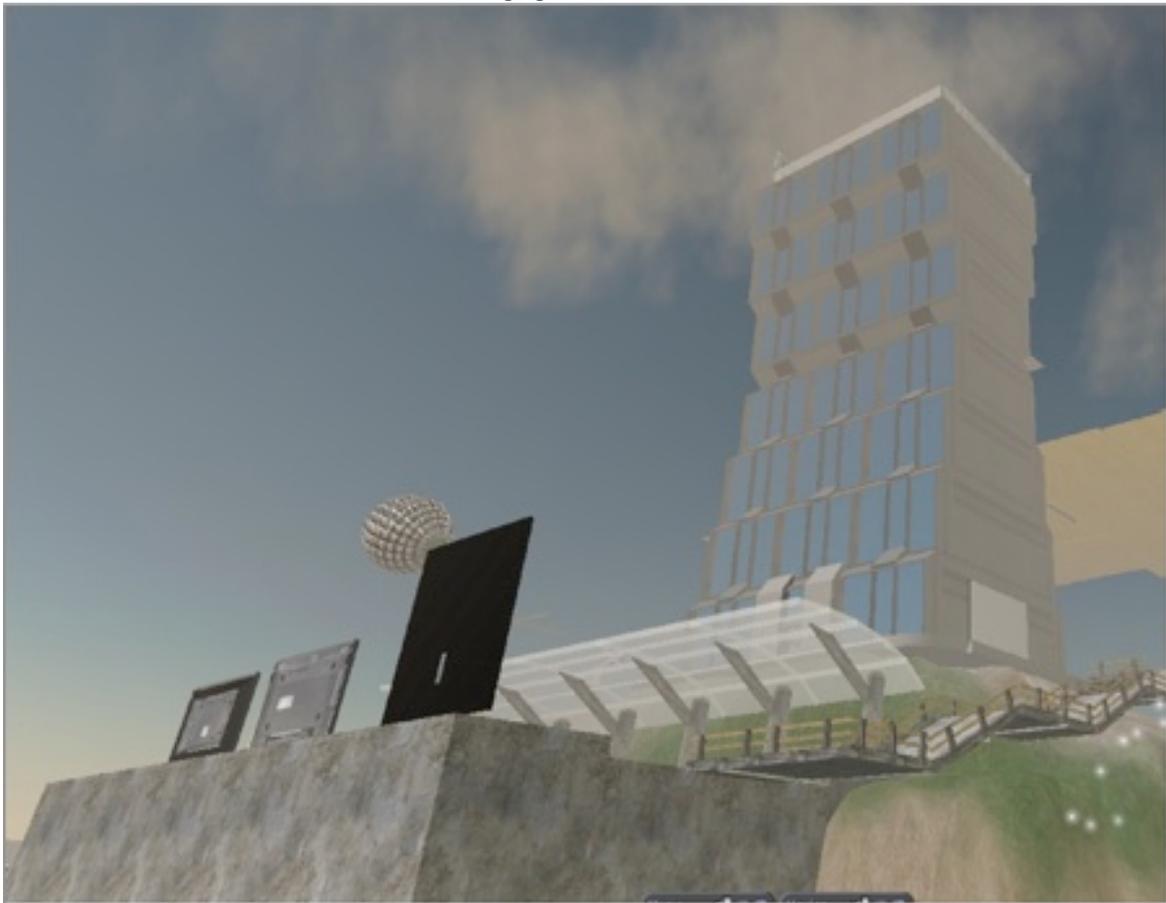


Figure 1: UTC Senior Project in Second Life

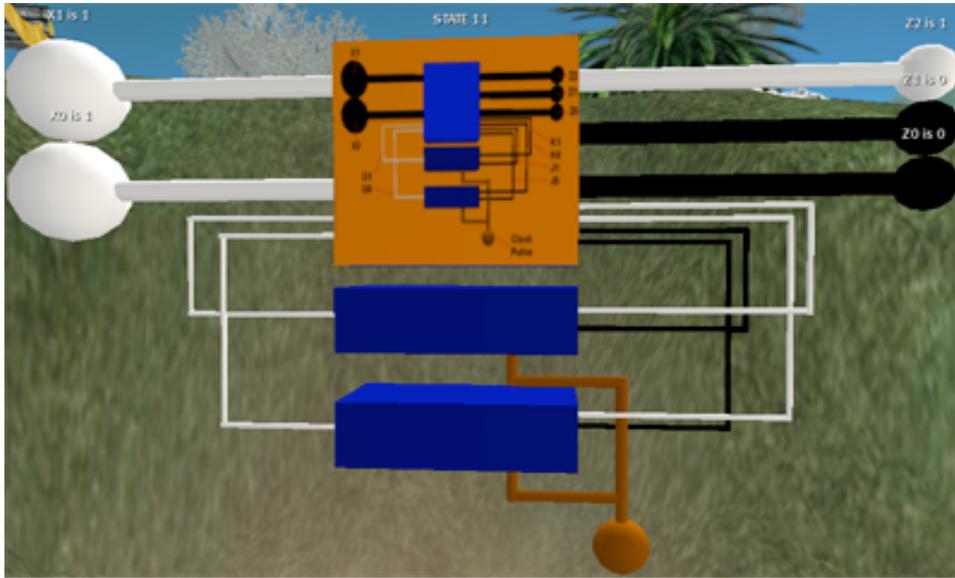


Figure 2: State Machine



Figure 3: Urban Crowding

An alternative that may address the concerns related to the cost of land ownership is The OpenSimulator project [6]. OpenSim is a BSD-licensed virtual world architecture containing simulator, grid, user, asset, and region server software suitable for running a private version of Second Life.

There are numerous advantages to running a locally hosted virtual environment. First, organizations have much more control over server availability and the timing of software updates. Institutions will have the ability to filter out anonymous accounts which are potentially disruptive.

OpenSim allows many simulators to run on the same computer, effectively lowering the cost of using a simulator in any virtual world.

OpenSim is used in several private grids as well as two public experimental grids ([www.deepgrid.com](http://www.deepgrid.com) and [osgrid.org](http://osgrid.org)). The current version has limited physics simulation compared to Second Life, and is not connected to the Second Life Grid (it is compatible with the Second Life client viewer program). OpenSim is under active development and is rapidly improving.

### 3 Real Currency Economy Games

Second Life has two unusual (but not unique) features that have contributed to its success. First, Second Life, unlike many other virtual worlds, recognizes the ownership rights of the creators of virtual property. Creators can, for example, make copies of their own objects and give them away while disallowing the recipients from making more copies. The second feature is the easy conversion between Linden\$ and US\$, which allow artists to receive “real money” from their virtual creations. This combination has led to an explosion of high quality inexpensive virtual items such as the ones sold at [shop.onrez.com](http://shop.onrez.com).

The marketplace, and the intellectual property policy followed by Linden Labs, contributes to the suitability of Second Life as a distance education platform. Many virtual worlds have Terms of Service granting all property rights in virtual objects to the world creators; many educators prefer the Second Life approach allowing them to retain ownership of their creations. The virtual marketplace is also a boon to educators; students or educators can cheaply and easily create an aesthetically pleasing virtual environment complementing the custom creations.

However, Real Currency Economy (RCE) games do raise a number of thorny issues in terms of taxation and public policy. What difference, if any, is there between a store in Second Life selling virtual items for Linden\$ which the store owner then converts to US\$ on the Lindex currency exchange or a store located on the internet selling downloadable items for Japanese Yen which the store owner converts to US\$ and deposits to a bank account? Linden Labs reports 129 avatars that have greater than \$5000 monthly operating profit [7] meaning that there are users able to live comfortably on income generated inside Second Life.

Obviously, someone earning a living selling virtual property will owe income tax. But does the taxable event occur when the Linden\$ are converted into US\$, or does the “income” occur when the Linden\$ are earned within the virtual environment? For the hypothetical Yen example, tax is owed whether or not the Yen are ever converted into US\$. But if Linden\$ transactions are subject to the same tax laws as Yen (or even US\$), does this mean that transactions occurring entirely in Second Life are subject to income tax

and possibly even sales tax? Looking solely at Second Life, one possible answer is to say that Linden\$ is as much of a currency as Yen, and that therefore exchanges of Linden\$ are taxable events—a decision that has major implications for a casual player who buys and later sells a small plot of virtual land. If we accept that Linden\$ count as a currency, what about World of Warcraft (WoW) Gold from Blizzard’s game? A crucial distinction is that Linden Labs advertises and supports exchanges between Linden\$ and US\$, but Blizzard forbids the “sale, gift or trade in the ‘real world’ of anything related to the Game” [8]. Despite this prohibition, WoW gold is readily available, and at least one company [9] has a thriving business selling virtual currency. There is also a thriving trade in accounts containing high-level characters [10]. A similar situation exists for CCPGame’s EVE Online [11]. It seems clear that players who sell their accounts for hundreds or even a thousand dollars have earned income. But was this income earned solely from the sale of an officially non-transferable virtual asset, or was this income earned steadily over months or years as the player accumulated experience and items? In the extreme case, if we override these companies and decide that WoW gold and EVE ISK has tangible US dollar value, then do teenage players owe taxes on in-game trades or lucrative “drops?” And does that mean that the monthly game charges qualify as deductible expenses? And are EVE players guilty of assault and battery if they destroy another player’s spaceship? These questions have attracted quite a bit of debate [12-18] from online forums. The authors humbly suggest that if virtual transactions are to be taxed at all, they be treated as capital gains taxes with taxes due only when and if the virtual items are sold for real currency.

A completely different question arises when anti-gambling laws are considered with respect to RCE games (here we consider only games whose publishers themselves claim have currency with real value). Second Life recently banned gambling [19] amid speculation that, since Linden\$ has a “real” value, gambling with Linden\$ violated US laws on Internet gambling.

MindArk’s Entropia Universe (formerly Project Entropia), like Second Life, promotes its currency PED as having real value [20]. However, unlike Second Life, numerous trade transactions occur between a player and a non-player trader terminal (tt). To greatly simplify, a typical play session might involve a player making a “deposit” of real money to convert to PEDs, using the PEDs to buy ammo and other supplies from the tt, and using the ammo to hunt monsters. The monsters could drop nothing, usually drop items worth less than the cost of the supplies and repairs needed to kill them, but occasionally drop extremely lucrative items. The game is calibrated so that in aggregate, players deposit PEDs in larger amounts than they withdraw them, so that typical players average less loot from hunting than they spend on ammo, supplies, and repair costs. Players have speculated whether Entropia Universe qualifies as either a gambling environment or a Ponzi scheme [21]

Banking is another area where virtual activity may be controlled by real law. An organization in Second Life named

Ginko Financial promised to pay depositors an interest rate exceeding 44% per year [22], but the owner refused to identify how the bank was able to earn the money and did not answer whether the bank was profitable at all [23]. Ginko Financial was unable to satisfy its obligations, and investors lost in excess of \$700,000 to its investors [24]. Surprisingly, even after the collapse, Ginko refused to disclose what its investment plan had been. The collapse attracted widespread attention, with much debate over whether banking laws and Ponzi laws applied, or should apply, to virtual transactions [25–28]. In January 2008, Linden Labs prohibited unregulated banks from offering interest on deposits. [29].

Ginko Financial’s collapse attracted attention precisely because of the ready legal conversion between L\$ and US\$. In a situation receiving far less attention, an executive of Eve International Bank absconded with 790 billion ISK [30], estimated to be worth \$170,000 [31]. The avatar bragged that he “enjoyed stealing your money” [32]. However, the terms of service for Eve Online forbid the exchange of ISK for real money, and the actions taken by “cally” did not violate the terms of service. The difference in treatment and publicly between Eve International Bank and Gink clearly illustrate the difference between games with a fictitious currency and RCE games. Game or virtual world designers need to carefully consider the legal issues of virtual worlds using “real” money including tax issues and the fact that many activities that would ordinarily be uncontroversial (imposing a death penalty, or introducing player-vs-player abilities) now have a tangible and real economic cost. At the same time, RCE games have benefits in attracting outside investment and the creation of high-quality virtual assets by third parties.

## 4 Conclusions

Continuing improvements in computing power and high-speed Internet access have led to an explosion in the popularity of multi-player online environments. Programs like Second Life provide a physics and graphics engine for anyone to display 3D content. The availability of high quality environments such as this allow for new opportunities for advanced CS students to learn leading edge skills.

There is an increasing awareness by all parties that the virtual in-game items have value, with a few companies explicitly marketing the possibility of players earning a living based on their in-game activity. However, this opens a host of thorny issues relating to taxation and prohibitions against on-line gambling, which could reduce the ability to relax and “just have fun” without worrying about real-world implications of game events. The links between the real and virtual world are increasing. The authors share the opinion that in the long term, a shift to 3D graphics from the current 2D web is as inevitable as was the shift from text-based Usenet to the graphical World Wide Web. However, we can not guess which platform or company will enable the transition. The current debate on what extent Internet transactions should be taxed will be dwarfed by concerns over

the taxation of the virtual economy, especially in light of people who make a substantial profit selling items for games which officially have no cash value.

## 5 Acknowledgements

We thank our project team, Russell Buck, Tim Ritzema, and Elizabeth Morgan, for introducing UTC to Second Life. Kathy Winters acted as Senior Project Coordinator and instructor of record for this project. Thanks to Linden Labs for proving land to support our efforts.

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