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Research Article

Simulation & Gaming
1–17
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DOI: 10.1177/1046878120968605
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Simulating Peace Operations: New Digital Possibilities for Training and Public Education

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Abstract

Background and Motivation. A plethora of warfighting games exist commercially, but there is a lack of **digital games** that deal with peace processes. Furthermore, none simulate actual **peacekeeping**. The **United Nations** currently deploys about 100,000 peacekeepers to some of the world's most dangerous zones, where peacekeepers save lives, alleviate suffering, and help create conditions for peace. The **United Nations** and national militaries lack **peacekeeping** simulations to help train their soldiers. Additionally, the public needs to learn more about the way **peacekeeping** works. Thus, **peacekeeping** simulation and gaming are worth exploring, especially in the rapidly evolving digital space, which offers new avenues and benefits.

Methods. We review the meager literature on the subject and observe that there are few **digital games** to directly draw from. We build on previous work that argued the need for such development, but we now assess important design principles and parameters. We draw upon **peacekeeping** tabletop exercises that are already well developed.

Results. We conclude that excellent scenarios and simulation technologies exist that could be combined quite easily for effective **peacekeeping training** and public education. We find key materials and scenarios in exercises of the **United Nations** and of the **Pearson Peacekeeping Centre**. Highlighted areas for future digital design are the inclusion of non-military avatars, emphasis on soft skills development (especially **empathy**), and realistically complex links between actions and consequences.

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Conclusion. While describing some UN exploration at a proof-of-concept stage, we suggest that both the **United Nations** and the gaming industry should explore the idea further to achieve synergies between institutional and entertainment applications. The growing capacity of digital technology allows significant innovation, yielding results that could be useful, ethical, enjoyable, and potentially profitable.

Keywords:
digital games, peace simulation, empathy, peacekeeping, training < objective, United Nations, virtual gaming, peace operations, stability operations

Video games can play a role in opinion-shaping and, in some cases, in preparing players for certain types of employment. For instance, the game *America's Army* developed by the US Army is now given out at recruitment centres and available free online (United States Army, 2020). The game has encouraged popular support for the military ethos, while emphasizing positive aspects of that ethos (duty, honour, courage, etc.). The game helps players learn what it is like to be a US soldier. Most gamers play the game for entertainment only, but for some it is an early form of training. In addition, a great many are influenced and educated by its messaging (Mead, 2013).

Subliminal messaging also happens through a plethora of commercial first-person shooter (FPS) games that glorify combat. Such games often involve *foreign-looking* opponents; thus, they risk dehumanization and *othering* of a perceived enemy. To better model the real world and foster a solutions-oriented approach to human conflict, there is a great need for games and simulations that explore the human dimension of armed conflicts, the effects of combat on local populations, and, most importantly, the wide range of realistic initiatives to bring about stability and sustainable peace in conflict-ridden areas of the world.

Most military operations involve much more than the simple combat seen in commercial FPS, and soldiers often work with foreign populations for peacekeeping and nation-building. However, there is a lack of digital simulations that cover peace operations (Dorn, Webb & Pâquet, 2020). To help introduce and prepare people for such operations, new exploratory simulations could portray the many shades of gray in contemporary conflict environments, as well as the range of activities for conflict resolution and the spectrum of ethical use of force. To be realistic, simulations should also cover civil-military interactions inside field missions, especially for training UN soldiers, UN police, and international civilians, i.e., personnel of the United Nations and humanitarian organizations such as Doctors Without Borders, the International Committee of the Red Cross, etc. While some suggestions on "peace gaming" have been made (Brynen & Milante, 2013; Gelot, 2020; Brynen, 2020), this potential avenue has yet to be developed in digital simulations either for UN training or for broader popular education.

A new peacekeeping genre of game could offer similar role-playing adventure to wargaming, but instead of abundant shooting, it would highlight ethical judgment,

humanity, and the strictly limited use of armed force under realistic Rules of Engagement (ROE). These restrictions include using force only as a last resort, proportionality, and the assessment of consequences, including the effects of peacekeeper actions on the broader peace process. It would provide more cerebral challenges than normal FPS games, appealing to different audiences and instincts. Peacekeeping games might show mass atrocities, but players would try to stop them, not create them. Scenarios would be based on real-life experiences of peacekeepers in field operations.

This new kind of game would send a new kind of message and provide training for different ends. FPS gamers who are looking for new challenges, and others who are turned off by the FPS genre are a potential market. Students and practitioners in areas such as peace, conflict and international development studies would relate to the player characters and predicaments involved. The marketing would have to stress complex and challenging adventure over violent adventure.

Peacekeeping games and simulations would be useful not only for public education/entertainment but for the training of peacekeepers (military, police, and civilian) deploying to UN operations as well. The detailed provisions for the two audiences would be different, but the games and simulations would share many similarities. Fortunately, digital design tools offer immense flexibility.

Of course, soldiers and others who operate in conflict and post-conflict environments cannot receive all of their training on flat screens, or from sophisticated mechanical simulators. Peacekeeping practitioners and war-fighters still need to engage in live human interactions, including combat-type interactions. Physical fitness, dexterity, and endurance plus mental resilience and in-person team cohesion all contribute to broader mission success in difficult environments. So soldiers and peacekeepers must continue to train on real terrain. But digital training can contribute to the overall training effort.

While in-person exercises offer more human interaction among a small team, digital simulations have many advantages: play at any time and place; solo or in large groups online (over a million played in certain Massive Multiplayer Online Role Playing Games or MMORPG); greater range of scenarios and environments (including Virtual Reality options); recording of game play and automatic assessment (to supplement instructor observations); cost effectiveness (especially as large numbers of players do not require travel); and progression at a player's level of skill, time, and energy. The gaming reach through the internet is global, so any combination of players is possible, including soldiers from different nations who are scheduled to serve together in the field. Finally, digital games are becoming much easier to design and develop, with well-developed asset packages (for both Unity and Unreal engines) and game mechanics available for purchase at low costs.

There are, of course, the usual challenges of obtaining proper licences and permissions, but these obstacles have been overcome in thousands of games and simulations in the past, with many digital assets easily purchased with all necessary permissions. Significant problems for digital products include cyber espionage and cyberattack, and annoying computer glitches. But the gaming community and militaries are learning to deal with these risks.

Creating peacekeeping simulations and games would still be challenging. Building on previous work (Dorn, Webb & Pâquet, 2020), we examine in detail the objectives, principles, and issues of adapting contemporary gaming for simulated peacekeeping. We review the benefits and drawbacks of rapidly evolving digital gaming technology and show how it offers a new means to model conflicts, practice complex decision-making and provide experiential learning to deal with ethical and legal dilemmas. This article explores ways to foster essential peacekeeper traits, such as empathy and insight. It focuses first on training needs, with the public gaming applications considered second. It suggests a conceptual and intellectual foundation for further development of digital simulations, thus advancing the general field of peace gaming (Crookall, 2013; Darvasi, 2016).

Peacekeeping Training Objectives

As with any training simulation, whether physical or virtual, the challenge is to come as close as reality as needed to learn valuable lessons.[1] The challenge has always been to replicate the environment to the point that the trainee (a) responds similarly to the way they would in real life, and (b) learns lessons from experiences that are applicable in real life. In this area, training and entertainment are separate distinct activities. But there is no reason that serious training cannot also be fun for the trainee or that popular games cannot involve some elements of learning.

There is also a need to ensure a training simulation does not teach *bad* lessons, e.g., that armed force can be over-used with little consequence, e.g., if peacekeepers engaging with hostile forces inadvertently kill civilians as "collateral damage." (This is relevant for traditional military simulation as well, but less so.) Ingraining player behaviours or attitudes that prejudice mission success, i.e., eventual peace, must be avoided. This is why standard FPS games are of little value in training for complex contemporary military operations. Their message can even be counter-productive to peacekeeping, such as the inappropriately named *Peacekeeper Trench Defense* game that tells the player: "You're the Peacekeeper, one of the world's toughest elite soldiers. … slay endless waves of enemy hordes, and restore the peace!" (Spil Games, 2016)

A deeper search of current commercial games shows more promise. The popular *Arma* series (Bohemia Interactive, 2013) involves players controlling a soldier avatar in a NATO-type peacekeeping mission; however, the gameplay is centred on combat, not peacekeeping. It does have an "Laws of War" expansion-pack. *Virtual Battle Space* (VBS), from which *Arma* is derived, is a widely used and sophisticated simulation platform designed for military use (Bohemia Interactive Simulations, 2020). At least two national militaries, Sweden and Australia have produced UN variants of characters, uniforms, and vehicles, and developed some peacekeeping-type scenarios (e.g., rioters throwing rocks, non-lethal force options, cultural awareness capabilities) for national training. So modifying such games for UN peacekeeping is a possibility, but there is a danger that some of the remaining warfighting elements will remain that contradict the peacekeeping ethos, roles, and UN look and feel. What we propose is different, especially as it includes the complex civil-military interactions seen in peacekeeping, well beyond that seen in warfare.

While war is sometimes described as the most complex of human transactions, we would argue that peacekeeping is often more complex than war. It does not always involve a clear line between *friendly* and *hostile* forces. It involves a broad range of actors other than military forces, including groups of varying degrees of hostility to each other and the UN mission. While it may necessitate the use of force, such use is subject to extra ethical and legal constraints and strong practical limits.

Training police peacekeepers—whether as observers or mentors to local police, as law enforcers, or as members of formed police units—would include reaction to and potential use of kinetic force, while operating *defensively* in a high-risk environment. It also requires a capacity to monitor, to report, and to investigate. There may even be domestic applications, e.g., for police training, with this genre of game.

Peacekeeping games should also teach de-escalation, cooperation, situational discernment, and maximum restraint in the use of armed force while pursuing mission objectives. The environment must comprise more than just shooters and targets, and the activities must involve more than fire and manoeuvre. Success must depend on the timely and balanced employment of the full range of tools available, including the nuanced use of force but only where appropriate (United Nations, 2017).

Fostering Empathy and Other Essential Traits

One of the main goals of peacekeeping games should be to bolster and reward *empathy*. Most FPS games do not encourage this and may actually discourage it by objectifying *targets* and rewarding *kills*. By contrast, peacekeeping games would penalize players for causing undue harm, overuse of force, violations of ROE or threatening the peace process, while rewarding players for empathetic actions. While some features can be borrowed and modified from current FPS games, most of these do not reward either minimal force (except through reduced ammunition consumption) or humanitarian acts such as treating friendly, enemy, or neutral wounded.

Most commercial FPS games typically represent non-playable characters only as gun-wielding targets that do not engender empathy—just like a strategic bombing game that depersonalizes cities and describes them entirely in terms of their industrial production or air defences. *Dehumanization* occurs when the *other* is seen simply as a target (e.g., from a plane at 1,000 feet, or even an opponent 10 metres away ready to shoot at you), not when one is forced to confront and treat the injuries inflicted. A FPS game that puts the player into a peacekeeper avatar who witnesses an atrocity can evoke empathy, particularly when personal relationships are developed as part of the characters and storylines (Bal and Veltkamp, 2013).

Some military games and simulations treat and evacuate the wounded in combat, including civilians. This complicates *kinetic* actions but adds realism. While there has been debate on the increase in non-combatant over combatant casualties in modern conflict (Marc, 2016; Roberts, 2010), much contemporary war is fought "among the people" and within populated areas (Smith, 2005, pp. 346–353). This aspect should play an even greater role in any peacekeeping simulation. Peacekeepers arriving at a village might find wounded non-combatants, friendly and hostile, requiring treatment

or other responses on a scale that interferes with the original mission. A realistic simulation should expose players to such difficult dilemmas.

There is a broader question of whether empathy (as an abstract quality) can best be taught, encouraged, or practiced through interaction with non-real entities in a simulated electronic environment. The player *knows* that the entities do not exist, and that knowledge lurks behind even the most vivid imagination. But using the game's virtual space as a medium for interactions between multiple *real* players, possibly located far apart in the world (e.g., in their home countries) might also have greater scope for developing empathy. For instance, Multiplayer Online Games can develop teamwork and a better understanding of group dynamics (Bonk & Dennen, 2005).

In the authors' experience on Canadian and international exercises, very real stress and empathy can be fostered during tabletop exercises. For instance, public affairs officers speaking to simulated media still must explain their own awkward performance to the real general officer they report to in the game. Or, when the head of an Emergency Room realizes that their hospital team has underestimated the scale and severity of a simulated mass casualty incident, they have to confront the reality that, in real life, people would have died unnecessarily. Here, empathy and imagination carry an element of personal risk as well as reward, and thus carry greater training potential.

The knowledge that a physical or digital training experience—however realistic—was not "real" *should* help to limit any trauma, while at the same time offering some inoculation against future traumatic experiences. But as a caveat, realistic peacekeeping training must portray real tensions and stresses without inflicting any real trauma.

In parallel with empathy, a peacekeeping game should also teach soft skills such as cultural and gender sensitivity, and diversity awareness across the military-police-civilian and other cultural divides, including with NGOs that require the *humanitarian space* to be independent and not viewed as part of the peacekeeping mission. Other dimensions to explore include the peacebuilding and development tools and actors that enable local populations through socio-economic development.

Training in soft skills for peacekeepers, especially interactions with one an other, is a key part of the *Gaming for Peace* initiative (GAP-Gaming for Peace, 2020). In the prototypical GAP digital game, the player follows a storyline in two-dimensional space and selects from multiple choice questions, with answers that determine subsequent storylines, to show skills such as cultural understanding, cooperation and sensitive communication with peacekeepers from other nations (Edwards, 2019; Holohan, 2019).

Also linked to empathy is the development of relationships, which involves some element of trust, as well as an understanding of others' motivations, beliefs, and intentions. These lessons can be explained in the abstract, and used to develop courses of action, but they are more likely to be learned from direct encounters with individuals, whether in real life or in a simulation. For instance, the Australian Defence College has been developing Avatar Augmented Role Play (AARP) as a form of *digital puppeteering*. A subject matter expert operates a scenario character using voice morphing to create unique dialogue. This can be useful to play characters such as locals from ethnic

minorities and child soldiers, which could not be played by real children during in-person exercises for ethical and legal reasons.

Computer software is increasingly able to simulate realistic human interactions with stochastic conversations and meetings, involving life-like characters speaking with coherent simulated speech. These characters are also *influenceable*—that is, the player's actions and words must be part of the non-playable character's subsequent actions. A disingenuous player might engender distrust and defensiveness; a naïve player may be manipulated and exploited. An effective player's actions will conform with the purpose and principles of peacekeeping and deal wisely with the inherent dilemmas of peacekeeping.[2]

Peacekeeping games should also allow positive or negative consequences of actions to be played out. For example, showing *too much* empathy towards one conflicting party would create a perception of favouritism, and undermine the broader peace process.

While purpose-built peacekeeping training simulations are lacking, there is a long history of military, police, and civilian tabletop exercises relating to peacekeeping. Much can be learned from these exercises to apply to the design of future digital peacekeeping games.

From Tabletop Exercise to Digital Simulation

The tabletop exercise (TTX) is a classic, even ancient, form of simulation, particularly for militaries. Training audiences practice teamwork, planning, decision-making, and other skills, usually based on a scenario presented to them on a map or terrain model, often with the ability to manoeuvre symbolic pieces, and usually with role-playing of a simulated opponent or other characters in play. The narrative unfolds around a sequence of problems assigned by the Exercise Control staff. Many lessons and considerations from TTX can be applied to digital simulation.

Through TTX for pre-deployment training, the player can also learn about the mandate and standard operating procedures (SOPs) of the future mission. Although theatre and mission-specific training have obvious advantages for some purposes, the advantages of playing in a fictitious host nation or region are numerous for both physical and digital simulations:

- Political sensitivities inherent in an intervention in a *real* sovereign territory are avoided (particularly important for a generic product supporting multiple international training audiences);
- Gaming in a previous theatre of actual operations is avoided, thus avoiding a tendency to *fight the last war*, and forcing audiences to consider their options objectively; and
- The *exercise reality* is better controlled by the staff; this facilitates control of the activity, but also allows scenarios to be tweaked to meet specific learning objectives.

TTX or digital simulations model the effects of decisions, to obtain realistic data, and drive the exercise play process in war-gaming. For example, military commanders deploy their forces against a hostile armed group (red team). Dice and probability tables determine the result in terms of mission outcomes, resource consumption, and casualties. In digital simulations, the computer would have stochastic methods to make such determinations. The key areas for both types of simulation are, therefore:

- Time/space management. Where actors are in time and space, including speed of movement, intervisibility, communication, and effects of terrain and climate;
- Combat and other effects. Deaths, injuries, damage to vehicles and equipment (including vehicle breakdowns, non-battle illness and injury); and
- Resource consumption. Expenditure and resupply of ammunition, fuel, water, rations, and other materiel (extendable to include less quantifiable resources, e.g., morale).

Networked simulators allow exercises to be conducted in a distributed manner, sometimes working in parallel with operational Command, Control, and Communications (C3) networks. This ability to work in a virtual environment from multiple, potentially remote locations may also enable simulations where different player groups each simultaneously control different agencies with different roles and objectives within a game scenario. This could allow large and diverse training audiences to learn together. For peacekeeping, there are many existing TTX but no digital variants. One TTX platform to potentially transform into a digital simulation is *Fontinalis*.

The Pearson Peacekeeping Centre Experience

During its existence (1994–2013), the Lester B. Pearson Canadian International Peacekeeping Training Centre (PPC) was heavily involved in developing training for military and non-military peacekeepers from around the world, including support to many major international military exercises.

The PPC developed *Fontinalis*[3]—a small country, torn apart by civil conflict between *Fontinalians* and their ethnic *Truttan* minority. This was first designed around the time of peace operations in former Yugoslavia but can apply to many contemporary conflicts. The original Fontinalis *legend* comprised simple thematic mapping (using local Canadian geography), replica open-source documents describing the political, economic, social, cultural, security background, legal documents (e.g., cease-fire and peace agreements, UN mandates, etc.), operational planning documents, and a detailed description of the general situation/dispositions at the start of the exercise. The development team engaged with subject experts in a variety of fields to ensure that the materials were plausible and internally coherent. Mission variants included UN-led (UN Mission in Fontinalis or UNMIF) and NATO-led (Fontinalis Force or FONFOR) interventions. While not (yet) incorporated into a digital game, Fontinalis was used and refined in many table-top exercises in support of PPC courses for over a decade.

As the market for tactical- and operational-level command post exercises (CPX) at PPC developed, the TTX evolved to include more detailed topographic mapping (replacing local Canadian toponyms and increasing population densities). Police training required the creation of national penal and legal codes (based on suitable real-world examples). Psychological operations required a coherent vision of national and local cultural norms. Civil-military cooperation required complex official and unofficial community power structures and development of individual key leader personas. (The demands of human-to-human role-playing interaction led to the design and development of everything from Fontinalian currency, to military and police uniforms, to local brands of alcohol and cigarettes.)

In the post 9/11 security environment, client demand shifted towards counter-insurgency interventions and stability operations, sometimes by an occupying force. The neighbouring state of *Trutta* was rebuilt as a secularized Islamic state, with both Christian minorities and Muslim fundamentalist factions. This required consultation with Islamic subject experts, and the creation of a detailed cultural-religious narrative. The specific scenario involved a UN-led political mission (UNAMIT) in parallel with a NATO-led military force (TRUFOR). By this stage, the topographic mapping and geodata were of such sophistication that they could be loaded into both actual command and control (C2) support systems, as well as C2 training simulation systems. Trutta also required a cultural *look and feel* that led to its own set of regional costumes, currency, etc.

In the early 2000s, PPC was also contracted to develop an African variant of Fontinalis for use by the African Union's regional peacekeeping training centres. Based loosely on an earlier UN-developed *Carana* scenario, the *République de Carana* was set in a fictitious African island region of Kisiwa. Again, detailed topographic mapping and a thorough political, economic, social, cultural, and security narrative was developed in consultation with African subject experts, reflecting authentic security issues, such as post-colonial political identities, natural resource exploitation, competing tribal power structures, and the use of child soldiers.

The PPC had been working concurrently on a digital training simulation system based on these scenarios when the Centre closed in 2013. Although this initiative did not get beyond a simple proof-of-concept stage, some of the ideas are reflected in the present article. The development focus was on identifying behavioural variables in local individuals and groups, including both combatants and non-combatants, that would change in reaction to peacekeeper interventions or other group interactions. The influence depended on peacekeeper strength and distance (i.e., how many police/military in a village, how far away from the UN base), as well as the prevailing social conditions (e.g., food/water/resource supplies, and media influences). The accuracy of the simulation depended on sound analysis of the real-world mission experience, provided by the PPC's operational research branch.

The next stage would have been a conversion of geodata into the virtual terrain and computer-generated imagery necessary for tactical manoeuvre simulation, down to the FPS level of fidelity, and the software to model complex interactions between players and entities. The scenarios had already been drawn from real-world experiences, with a dose of imagination added.

New Scenarios and Levels of Play

Realistic training requires realistic scenarios. In the UN's considerable body of training materials, there are scenarios for table-top exercises for a range of peacekeeping roles. For instance, scenarios drawn from actual operations are incorporated into the recent training packages for United Nations Military Observers (United Nations, 2019). Some scenarios for potential simulation include:

- Mediation between two conflicting parties; Responding to the killing of a faction leader; Responding to attacks on civilians, including conflict-related sexual violence;
- Security threats against UN personnel (shooting, ambush, raids, kidnapping, etc.);
- Rescuing a UN team stuck in a minefield; and
- Responding to false rumours about the UN mission.

Ideally, future peacekeeping simulations would collectively cover the tactical, operational, and strategic levels. Simulations can be targeted at any of these levels and their sublevels (as a function of granularity and focus), but usually only one level at a time. At any given level, only the sublevel immediately above and below needs to be modelled. Levels at more than one remove will normally have their effect *through* an adjacent layer. Multiple layered games may allow for *zooming in/out* of levels at key points. This will reflect the training requirements of the audience in the simulation (i.e., formation staff versus unit commanders). In many entertainment games, as in many movies, the three levels—tactical, operational, and strategic—are conflated. Typically, the hero is a tactical actor who also makes operational and strategic decisions. For training simulations, this temptation would have to be resisted to be more realistic about the responsibilities assigned to different sublevels within hierarchical and complex organizations. Multi-echelon training can be done but the emphasis must fit with the intended employment and careers of the trainees. This makes targeted digital training more difficult, but new and powerful digital tools are becoming available to model the complexity.

Artificial Intelligence and Other Developments

The development of a peacekeeping game will pose new technical challenges. While these were outlined as early as 1997 in a workshop of the Cornwallis Group, for instance with the concept of *intelligent automata* in peacekeeping modeling (Woodcock & Davis, 1997), these challenges are now within the technological capacity of current gaming software, which is rapidly developing.

It is hard to assess how rapidly the frontiers of artificial intelligence (AI) will move forward. Contemporary simulators offer platforms for human-to-human interaction over distance, where players are represented by on-screen avatars, sharing a common game space. In order for AI to play a human negotiator, it would potentially have to:

- respond in a timely and realistic manner to *player* inputs;
- recognize emotion, nuance, tone—and perhaps also dishonesty (to no lesser extent, but also *no greater extent* than a human[4]);
- have a programmed *agenda*—priorities, goals, hot buttons, values—and will behave within those parameters;
- be able to *learn* from interactions; either to exploit to its advantage or to modify its goals (e.g., developing empathy of its own); and possibly
- *speak a different language*, thus have different levels of comprehension, influenced by the players' word-choice, intonation, or linguistic ability.

The rationale for AI-based avatars over human interactors is based largely on cost and flexibility, similar to AI in general. Despite high initial R&D costs, the desired outcome is replacement of a potentially expensive or unavailable human component or, more likely, the enhancement of it. The computer-based AI character comes with the game anywhere, and replicates itself infinitely for multiple users and audiences. In a training context, automating opposition and bystander roles frees up personnel for other training tasks. Diverse cultures, languages, appearances, genders and ages of non-playable characters (NPCs) can be created to meet scenario requirements. The realism with which this can be done with AI will increase rapidly, but there will remain roles for human interactors, whether in the flesh or using "digital puppets." In any case, digital training is not a substitute for in-person training but a complement to it.

The *Turing Test* stage, where a computer can reliably pass for a human (Turing, 1950), has not yet been reached. But AI is rapidly increasing in capability, as evidenced by the defeat of human world champions in chess and Go. In gaming, AI has made great strides especially in non-algorithmic dialogue of non-playable characters (Togelius, 2019). But until something like the Turing test is met, human interference will help ensure that the interactive narrative unfolds as intended and in a realistic manner. However, gaming engines powered by AI potentially allow a complex environment of players and NPCs, each behaving according to more-or-less predictive criteria, as a real person might.

One possible model for such a peacekeeping game is to start with a set of pre-programmed natural inclinations of the non-playable characters representing the local population. These parameters determine the degrees of loyalty to one side or the other, or for/against the *peace agreement* and its implementing partners. The application of *good* policies by the player's peacekeepers adjusts the margins of support one way, e.g., *bad* policies adjust the game to increased violence. For instance, if civilians are directly killed by peacekeepers, their family members may be more likely to join the other side. The peacekeeper avatar may also suffer consequences; the game could end with media shaming, repatriation, or a court martial! Conversely, reward systems can be set up for a range of appropriate actions.

The tools for designing new digital games are getting easier and better, allowing new and exciting avenues, especially for independent (indie) game developers without large studios. *Dynamic object-based* game design is now possible by purchasing malleable characters and game controllers, going far beyond simple reskinning.

Purchased components and characters (with complete code-level freedom) can be specially purposed so they become unique. The game can also be developed so that future versions or episodes are played using virtual or augmented reality (VR/AR). The possibility of adding some machine learning tools (e.g., for voice recognition and responsive code changes to gameplay) can also be explored (Dorn et al., 2020).

For training purposes, any simulation gaming process should also incorporate a dimension *beyond or after the game*. Training involves some form of evaluation and feedback. Winning or losing may be evident from aggregate point scores or *virtual death*, but the learning process requires an opportunity for an *after-action review*. Discussion of *what went right and wrong*, supported by an ability to *replay* action/reaction sequences, provides a forum for critique, self-evaluation, and learning. Here again, computer-based products have an advantage because of their ability to record, extract data, analyze, and automatically report, as a means to supplement instructor advice. As the late Dr. Ken Eyre liked to say: "We do not learn from experience; we learn from *thinking about* our experience."[5]

Here again, human engagement may be assisted, but not replaced by automation. Quantifiable performance criteria are relatively simple, such as rounds hitting intended targets (or also, in peacekeeping, rounds *not* hitting unintended targets). Qualitative criteria may be more challenging. A trainee who walks away from a negotiation without a satisfactory agreement may still not know why they were not successful, or what happened as a direct result of that failure. And (unlike some FPS games) repeating the same engagement *ad infinitum* is not good training for the real thing. Simulation-based automated systems offer the opportunity for data collection and analysis, which can be brought forward during the important after-action reviews. So new forms of player behaviour analysis can be developed, especially using artificial intelligence. All modeling should also include an additional element of randomization so that no two *identical* actions will necessarily have exactly the same outcome, but a probability towards *similar* outcomes.

While the United Nations has been placing emphasis on the development of AI, it is a long way from applying it in simulations.

United Nations Initiatives

The United Nations itself has started its consideration of peacekeeping simulation through a preliminary demonstration game using a third-person shooter model to show a few of the major challenges and dilemmas in modern UN peace operations. The demonstration game focuses on the need to foster a peace process that includes groups who have perpetrated attacks against civilians. There is a natural tension between the use of force for the protection of civilians and the need to be on good terms with all parties in a mediator capacity. Instead of winning a war, the goal of the game is to *win the peace*.

A playable preliminary demonstration simulation was developed as a *proof-of-concept* to show the basic elements of a potential peacekeepers game. It is currently being demonstrated to members of the Canadian Armed Forces enrolled in peace-

keeping courses to gain feedback. A more advanced demonstration is also being considered as a training prototype leading to an eventual simulation of multiple connecting episodes for use in training, potentially in cooperation with the Norwegian Defence International Centre and the International Committee of the Red Cross. Some advanced features are also envisioned for certain modules, including virtual reality, augmented reality, biofeedback, and machine learning tools. The simulation is also designed to demonstrate the use of new technologies (e.g., use of UAVs, landmine countermeasures, and advanced night vision). In its mature form, the simulation could assist in the planning of new operations or the conduct of current ones, using mission-specific episodes. Simulations can also be used to produce videos and imagery for training and public education.

The digital simulation would allow players to analyse complex situations, e.g., by playing a United Nations Military Observer encountering crimes against humanity, terrorism, and organized crime. The new simulation and the project will, hopefully, inspire and develop a new medium for learning within the world organization. This new genre of simulation can be modelled realistically after UN peacekeeping. However, the United Nations itself has historically been slow to take up new technologies; as a "disruptive technology," digital simulation has yet to be applied in the training of UN peacekeepers. The envisioned new simulations would have educational as well as training value, with versions of it available for the general public to play.

Public Education and Commercial Games

The general public has little awareness of what peacekeepers do. The mandates coming from the UN Security Council and the consequences in the field are a mystery to many. Peacekeeping is not regular soldiering but also not quite policing; as former UN Secretary-General Dag Hammarskjöld is widely quoted as saying: "Peacekeeping is not a soldier's job, but only a soldier can do it."

But in a gaming context, this could prove intriguing to some elements of the general public, illustrating the range of tools beyond armed force, as well as the problems of using armed force. Digital games could indicate how military, police, and civilian personnel might interact with each other and with the local populations. They could show how missions can be civilian-led and centred on a peace process, while still deploying soldiers alongside their implementing partners.

As the US military and their private sector partners have discovered, the synergies of developing a tool that has both training and recreational applications can be significant. The games that young adults play may convey deliberate messaging regarding the role of the military in the contemporary world, the virtues of military service, and an encouragement to consider military career options. So, a subset of sophisticated gamers could be enticed by a game that offered similar excitement (and escape from everyday realities), but a different set of use-of-force parameters. Although many FPS players will likely not be interested, it is also possible that a complex interactive *peacekeeping game* might appeal to other (more gender-balanced) sectors of the youth gaming market. Outcomes could include a better understanding of global security

issues; greater support for peacekeeping operations; and a desire to serve as a peacekeeper or to work in areas such as human rights or humanitarian assistance.

Conclusion

The gaming and simulation community will undoubtedly continue to develop and expand into new areas, pushing the frontiers of imagination and complexity. For peacekeeping, realistic exercises in the physical world are limited and expensive, while digital simulation offers increasingly realistic models of dangerous and challenging environments at reduced costs. Especially during situations where physical contact is unfeasible (e.g., peacekeeping exercises involving many nations or during a pandemic crisis), digital simulations may provide important ways to train without having to bring people together physically.

Research and development resources are extremely finite in UN peacekeeping, and the training budgets to support peacekeepers mean there is limited opportunity for a *market-based* solution to emerge. It is therefore desirable that simulation-based peacekeeper training receive tangible support from the governments and groups which actively support peace and peacekeeping globally, especially at the development stage. This might include gamers who want to support humanitarian causes and see a wider array of possible game genres to explore.

A digital game for peacekeeping should not only be doable, useful and ethical, but also enjoyable.

Acknowledgments

The authors thank those who provide comments on the drafts, including Andrew Carswell, Ryan Cross, and Stewart Webb. Any errors remain the responsibility of the authors. This work does not necessarily represent the views of the Canadian Armed Forces, the Department of National Defence or the Government of Canada, or the United Nations.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship and/or publication of this article: The authors thank the Dallaire Centre of Excellence for International Peace and Security for a grant that helped make the article possible.

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Notes

1. In military exercises in the physical world, you generally use live ammunition on fake targets, or fake (blank) ammunition on live targets. Combining live ammunition with live targets requires non-lethal technologies (with their own lack of realism). For instance, paintball and *simunitions* both involve short-range, low-velocity rounds, and protective clothing, but do not adequately simulate real weapons. Improved technologies like a Weapons Effects Simulator (WES) have narrowed the gap. For instance, the Canadian Army's WES combines sensors on personnel and equipment with lasers attached to weapons to simulate the effects of firepower on targets. Networked systems and analytics allow for review and critique of combat incidents, further enhancing training value.
2. The three core principles of peacekeeping are: Consent of the parties; Impartiality; and, Non-use of force except in self-defence or defence of the mandate (United Nations, 2008). The dilemmas are many.
3. The countries of what became the *Salmo Region* were all named after different species of trout (genus *Salmo*), at the direction of the then PPC Director of Research and Development, Dr Ken Eyre, a keen fly fisherman.
4. For example, a computer might be able to detect dishonesty through minute non-verbal signs that a human could not detect. A role-playing computer should obviously not have superhuman capabilities.
5. Dr. Kenneth C. Eyre in conversation with one of the authors, Pearson Peacekeeping Centre, Cornwallis, Nova. Dr. Ken Eyre (1942-2017) was a founding faculty member and Vice-President at the PPC, and an acknowledged expert in simulation-based learning. He may have borrowed this aphorism from other sources. See also Dörner (1996).

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