

## NETWORKS AND NARRATIVE: VISUALIZING INTERNATIONAL LAW

Martin Lolle Christensen\* 

*This article explores the role of narratives in the use of information visualization by international legal scholars. It adds theoretical depth to the choice of visualization and connects different strands of international legal scholarship to reflect on new methodological directions of international law linked to networks and complexity. The article argues that the use of networks for the visualization of the interactions in the international legal system serves the purpose of transmitting to the reader narratives of international law. Scholars rarely explain the choices they make when using information visualization, especially so with more creative pictures of networks, and frequently treat them simply as didactical illustrations of complex information. Yet, the use of visualizations is linked to certain narratives of international law. This article explores how network aesthetics contribute to a narrative of international law as a complex system, a system that is multidirectional and multifaceted.*

**Keywords:** international law, networks, narratives, visualization

### TABLE OF CONTENTS

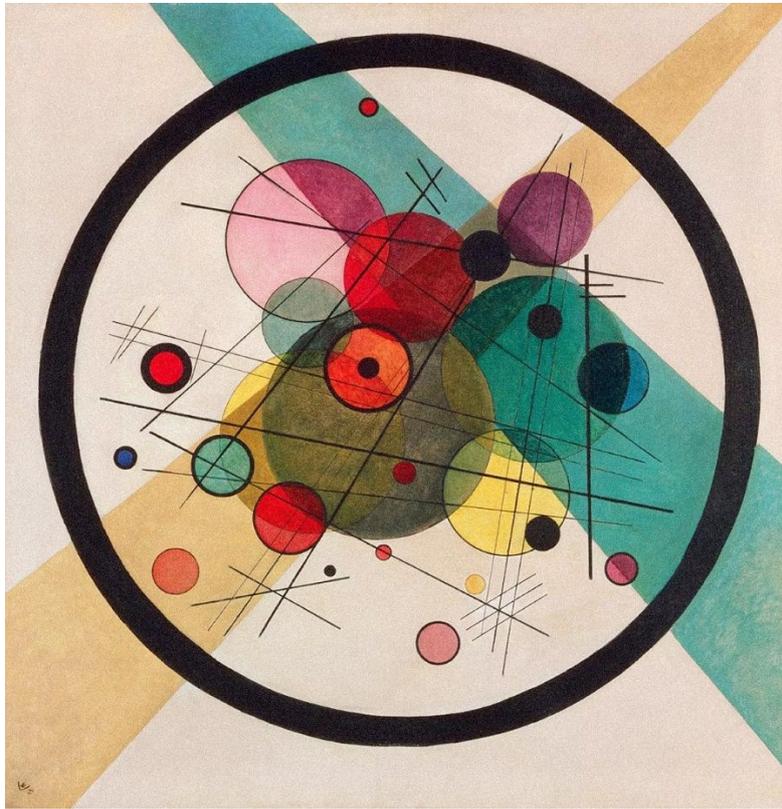
I. VISUALIZING INTERNATIONAL LAW: SETTING THE SCENE.....	28
II. NARRATIVES AND METAPHORS IN INTERNATIONAL LAW .....	32
III. NEW EMPIRICAL APPROACHES AND VISUALIZATION.....	37
IV. CONCLUSION .....	43

---

\* PhD Researcher, European University Institute, Florence; Martin.Christensen@eui.eu. I wish to thank Lucía López Zurita for insightful comments, Ioannis Panagis for data, and the two anonymous reviewers of EJLS for valuable feedback.

*It is pictures rather than propositions, metaphors rather than statements, which determine most of our philosophical convictions.<sup>1</sup>*

Richard Rorty



**Figure 1:** Wassily Kandinsky, *Circles in a Circle*, 1923. Source: *Philadelphia Museum of Art* – [www.philamuseum.org](http://www.philamuseum.org)

## I. VISUALIZING INTERNATIONAL LAW: SETTING THE SCENE

*Circles in a Circle* was an important work for Kandinsky. It was his first painting on the theme of 'circles' and one of his earliest geometric compositions. Kandinsky wrote that 'the circle is the synthesis of the greatest oppositions. It combines the concentric and the excentric in a single form, and in balance'.<sup>2</sup> This painting reflects Kandinsky's belief that 'certain

---

<sup>1</sup> Richard Rorty, *Philosophy and the Mirror of Nature* (Princeton University Press 2009) 12.

<sup>2</sup> 'Circles in a Circle' (Philadelphia Museum of Art) <<https://philamuseum.org/collection/object/51019>> accessed 28 June 2021; Will Grohmann, *Wassily Kandinsky* (Thames and Hudson 1958) 188.

colours and shapes signify emotions that can be codified and combined into a whole, reflecting the harmony of the cosmos'.<sup>3</sup>

In late 2016 and early 2017, this painting adorned the cover of Richard Collins' *The Institutional Problem in Modern International Law* and Guy Fiti Sinclair's *To Reform The World*.<sup>4</sup> There is nothing too unusual about this coincidence, as modern abstract paintings are often on the covers of books on international law, and Kandinsky is a common choice, though Klee is by far the most popular.<sup>5</sup> However, in reflecting on book covers as an object of international law, d'Aspremont and De Brabandere argue that the paintings on the covers draw the readers into a game, where 'the readers themselves create an explanatory narrative around the book'.<sup>6</sup> The Kandinsky painting lets the reader imagine the content of the two books. The composition of circles invites us to see both the precarious institutional structure of international law that Collins uncovers as a decentralized legal system, and the ways in which the powers and functions of international organizations are shaped and expanded by their political context, as argued by Sinclair.<sup>7</sup>

Thus, visualization has already affected the reader of international legal scholarship before they have even opened the book. The reader forms a narrative about the content of the book, undoubtedly shaped by other narratives of international law that the reader is already aware of. Visualizations are a part of narratives. We, as authors, shape our visualization of international law to fit the narratives we want to communicate to our audiences.<sup>8</sup> The photograph of a child clothed in a Red Cross sack tells a story

---

<sup>3</sup> Grohmann (n 2) 188.

<sup>4</sup> Richard Collins, *The Institutional Problem in Modern International Law* (Bloomsbury Publishing 2016); Guy Fiti Sinclair, *To Reform the World: International Organizations and the Making of Modern States* (Oxford University Press 2017).

<sup>5</sup> Jean d'Aspremont and Eric De Brabandere, 'The Paintings of International Law' in Jessie Hohmann and Daniel Joyce (eds), *International Law's Objects: Emergence, Encounter and Erasure through Object and Image* (Oxford University Press 2018) 334.

<sup>6</sup> Ibid 332.

<sup>7</sup> In correspondence with the authors, both confirm that they chose the cover out of availability, and fit with the theme of their respective books.

<sup>8</sup> 'The search for aesthetics is part of the daily work of international lawyers' d'Aspremont and De Brabandere (n 5) 330.

about the humanitarian imperative.<sup>9</sup> The historical paintings of the British Empire signing colonial treaties tell a narrative of international law as 'civilizational progress'.<sup>10</sup> Likewise, information visualization, an emerging trend in international legal scholarship, also emphasizes particular narratives about international law, though this aspect of visualization is rarely written about. Therefore, this article discusses the case of network visualization to argue that new empirical approaches to international law are not only means for visualizing data but also ways of understanding the configuration (or structure) of the international legal order. This article contends that the visualization of networks contributes to a narrative of international law as a complex system, a system that is multidirectional and multifaceted.

Among the endless ways in which international law is imagined and visualized, I concentrate on the visualization of the shape and structure of the international legal system. Before doing so, it is important to distinguish between the visuality of the internal and external aspects of the law. The visuality of the external is the depiction of the law as it is happening, represented in objects and paintings, maps and photographs.<sup>11</sup> The visuality of the internal part is different, as the law remains conceptual besides the legal material in which it is found; it is abstract, 'it is not physical or tangible until it is applied or described'.<sup>12</sup> Metaphors, allegories, and artistic illustrations are used to visualize these conceptual aspects of the law. The recent 'empirical turn' of international law, and the emergent use of computer science, have given new tools to the international legal researcher seeking to make law tangible.<sup>13</sup> Law can now be treated as information and

---

<sup>9</sup> Stephen Hopgood, *The Endtimes of Human Rights* (Cornell University Press 2013) 28.

<sup>10</sup> Kate Miles, 'Visuality of a Treaty: Reflection on Versailles' (2020) 8 *London Review of International Law* 7, 15–16.

<sup>11</sup> *Ibid* 7; see also Jessie Hohmann and Daniel Joyce, *International Law's Objects* (Oxford University Press 2018).

<sup>12</sup> Harlan Grant Cohen, 'Metaphors of International Law' in Andrea Bianchi and Moshe Hirsch (eds) *International Law's Invisible Frames - Social Cognition and Knowledge Production in International Legal Processes* (Oxford University Press, forthcoming) University of Georgia School of Law Legal Studies Research Paper 12.

<sup>13</sup> Gregory Shaffer and Tom Ginsburg, 'The Empirical Turn in International Legal Scholarship' (2012) 106 *American Journal of International Law* 1; Wolfgang

data, thus turning staggering complexity into (more manageable) visual information. It is this visualization, and the forms that it takes, that is the focus of this article.

The inspiration for this article comes from the fact that the choices regarding visualization in international legal scholarship, especially the more creative pictures of networks, most often go unexplained and are rarely elaborated as more than didactic illustrations of complex information.<sup>14</sup> Furthermore, the research is often 'agnostic' about the implications of the visualization.<sup>15</sup> The focus is the data, not the form. My aim is to add theoretical depth to the choice of visualization. As the visualization contributes to the story that the legal scholar is telling, the choices made should not be taken for granted. For this reason, the article reflects on new methodological directions of international law linked to networks and complexity as used in a small but emerging practice of international legal scholars.

Complexity is a key feature of modern society and network science is an attempt to study complex systems and their components. A network is a complex structure consisting of nodes that are inter-connected by links (edges). The primary characteristics of networks are 'openness, flexibility, extensibility, complexity, internal asymmetry, and an interdependence of individual parts'.<sup>16</sup> Networks are an interdisciplinary method used in a variety of scientific disciplines, such as biology, neurology, and sociology, but they are also part of a much wider conceptual understanding of modernity.<sup>17</sup>

---

Alschner, 'The Computational Analysis of International Law' in Rossana Deplano and Nicholas Tsagourias (eds), *Research Methods in International Law: A Handbook* (Edward Elgar Publishing 2021)

<sup>14</sup> None of the articles mentioned in section III below elaborate on the form of the network visualization.

<sup>15</sup> Expression taken from Urška Šadl and Fabien Tarissan, 'The Relevance of the Network Approach to European Case Law: Reflection and Evidence' in Claire Kilpatrick and Joanne Scott (eds), *New Legal Approaches to Studying the Court of Justice* (Oxford University Press 2020) 124.

<sup>16</sup> Patrick Jagoda, *Network Aesthetics* (University of Chicago Press 2016) 8.

<sup>17</sup> Warren Weaver, 'Science and Complexity' in George J Klir, *Facets of Systems Science* (Springer US 1991); Albert-László Barabási and Márton Pósfai, *Network Science* (Cambridge University Press 2016)

Complexity has also emerged in international law 'through the actions and interactions between actors in international relations'.<sup>18</sup>

In discussing the aesthetics of international law, Morgan states that 'while in isolation the law seems to embark on its own difficult course, in interdisciplinary mode it parallels, like a Nabokovian pale fire, the literary and aesthetic currents that surrounds it'.<sup>19</sup> If international law is perceived as a complex system, the aesthetics of this complexity, network aesthetics, should be paralleled in the narratives that international legal scholars create about international law.<sup>20</sup> It is this connection between narratives and aesthetics that this article reflects upon.

The next section outlines the role of narratives in international law, particularly narratives that describe the structure of the international legal system. These narratives rely on metaphors to explain the shape and structure of the international legal order. Section III builds on these insights on narratives and metaphors to explore how new empirical approaches to international law study and visualize complexity, expanding upon narratives and metaphors. It further argues that graphical representations of legal networks illustrate particular narratives about the structure of the international legal system and could aid in the creation of new narratives of international law.

## II. NARRATIVES AND METAPHORS IN INTERNATIONAL LAW

Narratives are an increasingly studied aspect of international law.<sup>21</sup> They are a way to both question historical contingencies and understand the ways international law is being represented. Seeing international law in narrative

---

<sup>18</sup> Steven Wheatley, 'The Emergence of New States in International Law: The Insights from Complexity Theory' (2016) 15 *Chinese Journal of International Law* 579, 581.

<sup>19</sup> Edward M Morgan, *The Aesthetics of International Law* (University of Toronto Press 2007) 8.

<sup>20</sup> Jagoda (n 16).

<sup>21</sup> Studying narratives is a stable part of Law & Literature, see James Boyd White, *The Legal Imagination* (University of Chicago Press 1985) 245; For international law see Andrea Bianchi, *International Law Theories: An Inquiry into Different Ways of Thinking* (Oxford University Press 2016) 296.

terms highlights the 'discursive and perspectival nature of international law, and allows us to understand the law not only as a system of rules but a world in which we live'.<sup>22</sup> In arguing for a 'turn to narrative', Windsor applies a typology from Ricoeur's narrative theory to the context of international law.<sup>23</sup> Windsor sees two dimensions in the narratives of international law: successional and configurational. All narratives contain these two dimensions, which are in competition with each other.<sup>24</sup> Among narratives focusing on the successional dimension, Windsor highlights the common 'progress narrative' in international law. The configurational dimension is predominant in narratives on the structure and organization of the international legal order.<sup>25</sup> I here explore narratives focusing on the configurational dimension (configurational narratives).<sup>26</sup> It is these narratives that are often expressed through metaphors about the structure of the law, and where networks, and their visualization, can be used to uncover the connections between the various elements of the international legal system.

Configurational narratives deal with the international legal order; they explain in different ways the divergence and convergence of international legal rules and institutions.<sup>27</sup> The idea of 'unity' in international law is at the centre of these narratives, seen as a positive value, an aspiration.<sup>28</sup> On the opposite side to unity, as a counter-narrative, is the idea of the 'fragmentation' of international law.<sup>29</sup> Koskenniemi sees the dichotomy of

---

<sup>22</sup> Bianchi (n 21) 294; Robert M Cover, 'Foreword: Nomos and Narrative' (1983) 97 *Harvard Law Review* 4, 5.

<sup>23</sup> Matthew Windsor, 'Narrative Kill or Capture: Unreliable Narration in International Law' (2015) 28 *Leiden Journal of International Law* 743, 746; Paul Ricoeur, *Time and Narrative* (University of Chicago Press 1990).

<sup>24</sup> Ricoeur argued that any narrative combines two dimensions: a chronological or episodic dimension (successional) and the attempt to construct meaningful totalities out of scattered events (configurational). Windsor (n 23) 746.

<sup>25</sup> Windsor calls these configurational-focused narratives 'master-narratives'. Windsor (n 23) 749.

<sup>26</sup> For an overview of the visualization of progress narratives, see Miles (n 10) 12–17.

<sup>27</sup> Lucas Lixinski, 'Narratives of the International Legal Order and Why They Matter: An Introduction' (2013) 6 *Erasmus Law Review* 2, 2.

<sup>28</sup> Bianchi (n 21) 293; See also Mario Prost, *The Concept of Unity in Public International Law* (Bloomsbury Publishing 2012).

<sup>29</sup> Lixinski (n 27) 3.

unity/fragmentation as a matter of narrative perspective: '[w]hat from one angle looks like a terribly chaotic image of something, may from another appear just as a finely nuanced and sophisticated reflection of a deeper unity'.<sup>30</sup> Other prominent narratives that make descriptive claims about the international legal system see it as either containing multitudes (pluralism), as being transnational and autonomous (global administrative law), or as being organized and integrated with domestic systems (constitutionalization).<sup>31</sup> These narratives arose, partly, in response to the fragmentation narrative. Thus, there is struggle and contestation between different narratives, all of them trying to represent the 'reality' of the international legal system. Likewise, insights from network and complexity sciences can be employed to represent a 'reality' of international law as both interconnected and evolving.<sup>32</sup>

International legal scholars, 'somewhat notoriously, tell stories all the time'.<sup>33</sup> A narrative is both *what* this story is and *how* it is told. This can be seen in the use of metaphors in international legal scholarship. Metaphors help visualize the narrative. They provide a language to convey the operation of law, and 'allow international lawyers to build a shared, tangible universe of legal meaning'.<sup>34</sup>

Metaphors become part of their narrative. Thus, configurational narratives of international law are full of metaphors about structure. A good example is the planetary metaphor by Simma and Pulkowski in *Of Planets and the Universe*.<sup>35</sup> They deem the metaphor of planets of self-contained regimes

---

<sup>30</sup> Martti Koskenniemi, 'The Fate of Public International Law: Between Technique and Politics' (2007) 70 *The Modern Law Review* 1, 25.

<sup>31</sup> Windsor (n 23) 749.

<sup>32</sup> See Steven Wheatley, *The Idea of International Human Rights Law* (Oxford University Press 2019) 48.

<sup>33</sup> Bianchi (n 21) 292.

<sup>34</sup> Cohen (n 12) 2.

<sup>35</sup> Bruno Simma and Dirk Pulkowski, 'Of Planets and the Universe: Self-Contained Regimes in International Law' (2006) 17 *European Journal of International Law* 483. A similar but less coherent metaphor is used in Joost Pauwelyn, 'Bridging Fragmentation and Unity: International Law as a Universe of Inter-Connected Islands' (2004) 25 *Michigan Journal of International Law* 903. See also Wolfgang

within the universe of the international legal system useful to describe modern international law. While it was conceived as a 'hierarchical pyramid structure' in the early 20<sup>th</sup> century, contemporary international law resembles 'a dense web' of overlapping norms in diverse subject areas.<sup>36</sup> Within the narratives of unity and fragmentation, the planets and the universe are apt for describing a system that allows for internal specialization. A planet can never escape the universe, much like a self-contained regime will always be part of the international legal system.<sup>37</sup>

Metaphors are not immutable, and they might change to better reflect the narrative they are inserted into. In science, one of the most famous shifts in metaphor was from the arboreal (tree-like) to something more weblike.<sup>38</sup> A notable alternative to the tree is the idea of a rhizome, popularized by Deleuze and Guattari in *A Thousand Plateaus*.<sup>39</sup> They were 'tired of trees', and their authoritarian centrality, so they found an alternative able to acknowledge multiplicities and multilinearities.<sup>40</sup> The rhizome metaphor is not common in international law, but in their highly influential paper on fragmentation and global law, Fischer-Lescano and Teubner argue that the solution to conflicts between legal regimes might be characterized as 'rhizomorphic' as it requires not so much the dissolution of different regimes,

---

Alschner and Dmitriy Skougarevskiy, 'Mapping the Universe of International Investment Agreements' (2016) 19 *Journal of International Economic Law* 561.

<sup>36</sup> Simma and Pulkowski (n 35) 484.

<sup>37</sup> Ibid 529.

<sup>38</sup> Trees are directional and hierarchical (trunk, branches and twigs). The tree is perhaps the most famous metaphor and illustration in science and remained central until the emergence of networks. Its history is described in Manuel Lima, *Visual Complexity: Mapping Patterns of Information* (Princeton Architectural Press 2011). On the shift away from trees in evolutionary science, see David Quammen, *The Tangled Tree: A Radical New History of Life* (Simon and Schuster 2018).

<sup>39</sup> A rhizome, unlike a tree, is not monodirectional, rather it reconnects and expands in different directions, with no fixed centre. It is heterarchical, not hierarchical. Gilles Deleuze and Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia* (Bloomsbury Publishing 1988).

<sup>40</sup> Ibid 15; see also Lima (n 38) 44.

but rather rebuilding those regimes with common reference points and some idea of harmonization.<sup>41</sup>

Developed to describe complex processes, metaphors can enhance thinking and spark creativity, but over time they might become a constraint if they rule out ideas that do not fit into the metaphor's structure.<sup>42</sup> Metaphors must therefore, from time to time, be tested. Thomas A. Smith conducted a pioneering study in legal network analysis that revisited the old metaphor of law as a seamless web.<sup>43</sup> After studying the web of American law in over 4,000,000 judgments, he found that the seamless web metaphor was inaccurate, at least if 'seamless' meant smooth, for the web of law is instead an 'uneven, clumpy web, with some parts thickly connected within themselves, but only loosely connected to other parts'.<sup>44</sup> Furthermore, Smith found that the citation network of a legal system shared characteristics with scale-free networks such as the World Wide Web and the scientific collaboration network.<sup>45</sup> Thus, legal networks can be studied in the same way as other complex networks. Complexity becomes an intricate aspect of the international legal system with this new methodology – if you want to understand international law, you must study it as a complex system. As such it can be said that it is changing narratives and metaphors that led to new methodological approaches.

---

<sup>41</sup> Andreas Fischer-Lescano and Gunther Teubner, 'Regime-Collisions: The Vain Search for Legal Unity in the Fragmentation of Global Law' (2003) 25 *Michigan Journal of International Law* 999, 1034. See likewise on global regulatory governance as a 'rhizomatic maze' Dimitri Van Den Meerssche, 'Regulatory Integration Across Borders: Public–Private Cooperation in Transnational Regulation' (2020) 31 *European Journal of International Law* 1561.

<sup>42</sup> Cohen (n 12) 13.

<sup>43</sup> Thomas A Smith, 'The Web of Law' (2007) 44 *San Diego Law Review* 309. The origin of the metaphor is ascribed to Frederic William Maitland, 'Prologue to a History of English Law' (1898) 14 *Law Quarterly Review* 13. See further Šadl and Tarissan (n 15) 98.

<sup>44</sup> Smith (n 43) 315.

<sup>45</sup> *Ibid*; see also JB Ruhl, Daniel Martin Katz and Michael J Bommarito, 'Harnessing Legal Complexity' (2017) 355 *Science* 1377.

### III. NEW EMPIRICAL APPROACHES AND VISUALIZATION

The use of computational methods to study international law is a new approach in empirical legal studies that takes as much from computer science as from political science in its research of the law.<sup>46</sup> Textual and network analysis are prominent methods in this approach. Proponents of these new methods see them as a 'third way' between defending traditional doctrinal legal methodology, and submitting to the encroaching methodology of political and social scientists.<sup>47</sup> The methods from computer science render legal analysis scalable and allow for deeper and wider studies of international law.<sup>48</sup> The ideal of these methodologies 'synthesises' the study of law with the computational analysis, allowing the researcher to find larger patterns, structures, and outliers than would be possible without it.<sup>49</sup>

Network analysis has been used in multiple ways in international legal scholarship. Without being exhaustive,<sup>50</sup> notable examples include citation network analysis, which uses citations (implicit or explicit references) between judgments, paragraphs, treaties, or other legal material to study the

---

<sup>46</sup> Alschner (n 13); Wolfgang Alschner, Joost Pauwelyn and Sergio Puig, 'The Data-Driven Future of International Economic Law' (2017) 20 *Journal of International Economic Law* 217; Urska Šadl and Henrik Palmer Olsen, 'Can Quantitative Methods Complement Doctrinal Legal Studies? Using Citation Network and Corpus Linguistic Analysis to Understand International Courts' (2017) 30 *Leiden Journal of International Law* 327; Šadl and Tarissan (n 15).

<sup>47</sup> Šadl and Olsen (n 46) 328.

<sup>48</sup> Alschner (n 13) 1.

<sup>49</sup> Jakob VH Holtermann and Mikael Rask Madsen, 'Toleration, Synthesis or Replacement? The "Empirical Turn" and Its Consequences for the Science of International Law' (2016) 29 *Leiden Journal of International Law* 1001; See also Alschner (n 13) 3: 'Computational legal analysis does not fundamentally change what international lawyers do, be it the doctrinal normative, interdisciplinary or empirical analysis of law, but it expands the tools at their disposal by treating law as data'.

<sup>50</sup> For a wider bibliography, see 'Suggested, Non-Exhaustive Bibliography, Databases and Software to Carry Out Data-Driven Empirical Research of International Economic Law' (2017) 20 *Journal of International Economic Law* 419; Alschner (n 13).

network formed by those interactions.<sup>51</sup> This analysis can entail either tracking how precedent is created (i.e. incrementally over numerous judgments or in one authoritative *grand arrêt*) or exploring how the case law of international courts grows more complex and evolves over time.<sup>52</sup> It can focus on judicial dialogue between courts or map the *universe* of treaties.<sup>53</sup> Likewise, social networks investigate the communities of arbitrators in international investment cases and uses obituaries to put together the 'invisible college' of international law.<sup>54</sup>

A commonality of these diverse projects is that the methodology allows them to see hidden patterns in complex materials. The computational approach focuses on understanding complexity and uncovering empirical evidence that can 'validate hunches and prove legal intuitions correct'.<sup>55</sup> It further seeks to 'reduce' complexity through these new approaches.<sup>56</sup>

There are different ways to visualize a network. Often the network is represented only as data (i.e. tables showing the cases with the highest

---

<sup>51</sup> Šadl and Tarissan (n 15); Wolfgang Alschner and Damien Charlotin, 'The Growing Complexity of the International Court of Justice's Self-Citation Network' (2018) 29 *European Journal of International Law* 83; Joost Pauwelyn and Wolfgang Alschner, 'Forget About the WTO: The Network of Relations between Preferential Trade Agreements (PTAs) and "Double PTAs"' [2015] *Trade Cooperation*.

<sup>52</sup> See e.g. Mattias Derlén and Johan Lindholm, 'Goodbye van Gend En Loos, Hello Bosman? Using Network Analysis to Measure the Importance of Individual CJEU Judgments' (2014) 20 *European Law Journal* 667; Urška Šadl and Mikael Rask Madsen, 'A Selfie from Luxembourg: The Court of Justice's Self-Image and the Fabrication of Pre-Accession Case-Law Dossiers' (2015) 22 *Columbia Journal of European Law* 327.

<sup>53</sup> Damien Charlotin, 'The Place of Investment Awards and WTO Decisions in International Law: A Citation Analysis' (2017) 20 *Journal of International Economic Law* 279; Alschner and Skougarevskiy (n 35).

<sup>54</sup> Sergio Puig, 'Social Capital in the Arbitration Market' (2014) 25 *European Journal of International Law* 387; Malcolm Langford, Daniel Behn and Runar Hilleren Lie, 'The Revolving Door in International Investment Arbitration' (2017) 20 *Journal of International Economic Law* 301; Luiza Leão Soares Pereira and Niccolò Ridi, 'Mapping the 'Invisible College of International Lawyers' through Obituaries' [2020] *Leiden Journal of International Law* (Forthcoming).

<sup>55</sup> Šadl and Olsen (n 46) 330.

<sup>56</sup> Alschner and Skougarevskiy (n 35) 563.

PageRank or HITS-Score), telling the reader that these are the 'best-connected cases with the highest authority'.<sup>57</sup> Another way to represent the network is through charts and figures that show the developments within it (i.e. the degree distribution between cases, the growth and decline in citations to a specific judgment).<sup>58</sup> In this sense, it follows the visualization style traditional to Empirical Legal Studies (ELS), brought in from political science.<sup>59</sup> Here, visualization aims to communicate the substance of the data effectively.<sup>60</sup> This type of visualization gives an accurate account of the properties of the network, leaving it to the reader to imagine its shape. The goal is clarity and iteration in the communication of data, and if international law is represented, it is as plots in a graph. However, computer-supported visualization allows for higher creativity and choice than is commonly found in the ELS literature. New ways to graphically represent a network emerge, focusing more on form.<sup>61</sup>

The most creative ways to present networks require visualization software. The nodes and edges can be given varied sizes and colours based on different metrics and the network can be moved around manually or using algorithms that simulate a physical system by placing the nodes into community clusters and giant 'clouds' or 'webs'.<sup>62</sup> A static 'snapshot' is then taken of the

---

<sup>57</sup> See e.g. Derlén and Lindholm (n 52).

<sup>58</sup> See e.g. Alschner and Charlotin (n 51).

<sup>59</sup> Lee Epstein and Andrew D Martin, *An Introduction to Empirical Legal Research* (Oxford University Press 2014) pt IV; Edward R Tufte, *The Visual Display of Quantitative Information* (Graphics Press 2001).

<sup>60</sup> Epstein and Martin (n 59) 228.

<sup>61</sup> Interaction with the network is also possible, often in connection with databases. See e.g. Leão Soares Pereira and Ridi (n 54); Dmitriy Skougarevskiy and Wolfgang Alschner, 'Mapping Investment Treaties' (Mapping Investment Treaties) <<http://mappinginvestmenttreaties.com/>> accessed 10 November 2020; 'Welcome to PITADbeta' (PITAD Investment Law and Arbitration Database: Version 1.0, Pluricourts Centre of Excellence, University of Oslo) <<https://pitad.org/index#welcome>> accessed 10 November 2020.

<sup>62</sup> See e.g. Mathieu Jacomy and others, 'ForceAtlas2, a Continuous Graph Layout Algorithm for Handy Network Visualization Designed for the Gephi Software' (2014) 9 PLOS ONE e98679.

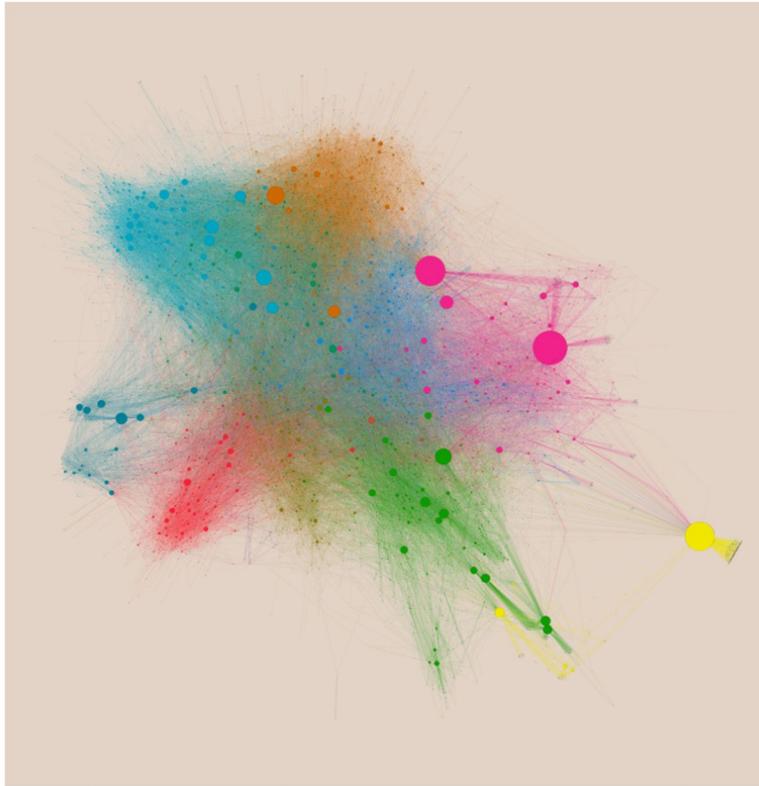
network.<sup>63</sup> These visualizations do not necessarily communicate the data in a clear, effective, and 'objective' way, as is the mantra of ELS visualization. The networks are shaped by aesthetic choices *made by the scholar*. Sometimes this choice is underutilized, with network graphs presented as a dense collection of grey blobs. Other graphical representations are more colourful.<sup>64</sup> Figure 2 provides a good example. It shows a citation network of 11,051 judgments of the European Court of Human Rights between 1960 and 2015.<sup>65</sup> The network is grouped and coloured according to modularity, a measure within networks that creates community clusters based on the distribution of edges between the nodes. The size of the nodes is based on the in-degree, the number of citations a given judgment has received. Using these relatively simple measures, overarching themes in the network become apparent: certain clusters are more isolated than others and certain cases are much more cited than the average.

---

<sup>63</sup> While the picture shows a static image, 'a network is never a static structure, even as network graphs, maps, or visualizations might sometimes suggest a fixed form. Networks depend on an active flow among interlinked vertices'. Jagoda (n 16) 8.

<sup>64</sup> See admirable examples in Lima (n 38).

<sup>65</sup> For a high-quality version of the image and a description of how it was developed, see 'European Court of Human Rights jurisprudence 1960-2015' (ImgBB) <<https://ibb.co/jvRH3bP>> accessed 10 November 2020. The network is built with a dataset from iCourts, Centre for Excellence of International Courts.



**Figure 2:** European Court of Human Rights Jurisprudence 1960-2015.

Another illustrative example is found in *The Shape and Structure of the 'Usable Past'* by Ridi, containing 15 graphical representations of networks of the jurisprudence of eight international courts and tribunals.<sup>66</sup> These citation networks are shown as giant nebulas of case law, with nodes of varied size and colour. They show the 'web of law' in all its intricacies. As in Smith's description, the web is not smooth but clumpy, yet by indicating properties such as community clusters, the distinctiveness of different parts of the international legal system becomes apparent. For instance, when comparing the clustering in investment arbitration to a regional human rights court, or if analysing the growing complexity of the WTO Appellate Body case law.<sup>67</sup>

While legal network analysis focuses primarily on studying the properties of networks, the representation of those networks should not go unnoticed. It

<sup>66</sup> The article also includes a US Supreme Court network, and a social network of arbitrators. Niccolò Ridi, 'The Shape and Structure of the "Usable Past": An Empirical Analysis of the Use of Precedent in International Adjudication' (2019) 10 *Journal of International Dispute Settlement* 200.

<sup>67</sup> *Ibid* 222, 211.

is contended that the visualization of the networks contributes to a narrative of international law as a complex system, a system that is multidirectional and multifaceted. The aesthetics of networks is not necessarily about controlling complexity but about embracing it.<sup>68</sup> In this regard, while the study of the properties of legal networks is about reducing complexity, and thereby controlling it, the visual representation embraces that complexity. Visualizations show the intricacies of complex composition, but do not necessarily reveal information of the network's individual parts.

Visualization contributes to the narratives that the international legal scholar creates. The graphical representation of networks is malleable to the aesthetic desires of an adept creator, and there are many aspects that can be included or excluded, highlighted or dimmed down. For example, Figure 2 borrows the colour scheme of *Circles in a Circle* (Figure 1) to lure the reader into seeing similarities between the two. In this sense, the use of networks can visually contribute to every narrative focusing on the configurational dimension of international law. Certain narratives will, however, benefit more from network visualization. Like Kandinsky's circles, networks can reflect harmony, and bring precarious objects into balance. They make the reader focus on the interactions rather than the individual parts. The imagined order of legal pluralism, characterized as 'heterarchical interaction of the various layers of law' is apt for the aesthetics of networks.<sup>69</sup> On the other hand, fragmentation becomes increasingly dubious when networks can show the multitude of interactions between the different regimes of international law.<sup>70</sup> Similarly, metaphors such as pyramids conflict with network aesthetics, while planets and the universe are much more congenial fits. In other words, tensions arise in a narrative when its different parts are no longer in tune. Time will tell whether network aesthetics will lead international lawyers to become as 'tired of trees' as Deleuze and Guattari were.

---

<sup>68</sup> Jagoda argues that we should stop trying to control networks and become 'non-sovereigns' Jagoda (n 16).

<sup>69</sup> Nico Krisch, *Beyond Constitutionalism: The Pluralist Structure of Postnational Law* (Oxford University Press 2010) 23.

<sup>70</sup> Charlotin (n 53).

#### IV. CONCLUSION

The visualization of international law as networks – interconnected nebulae of citations, social relations, institutional bonds – is meant to present complex interactions to the reader, in turn leading them to see international law as a system of staggering, but manageable, complexity. This article has brought together different strains of international legal scholarship to appeal for methodological reflection as to why visualizations should be viewed as more than a didactic tool to communicate information. Not only the properties, but also the form of networks should be appreciated and reflected upon. The aesthetic choices of the scholar allow them to communicate ideas of 'proliferating multiplicity' through these networks.<sup>71</sup> The article has left open the question whether this visualization reinforces already existing narratives – narratives that argue for multilinearity and inter-connectivity – or whether it coins a new narrative focused on the complex configuration of the international legal order. Such a narrative would, in turn, become a self-fulfilling prophecy in favour of the computational approach.

---

<sup>71</sup> Jagoda (n 16) 3.