# Defining Offensive Roles in College Basketball
Sean McClurg

By using data from synergy and the method of hierarchical clustering, I was able to group all college basketball players into four major offensive positions, and several roles for those positions.

The Synergy data contains information on how often a player went to a certain play type to score (Spot Up, Post Up, Pick and Roll-Ball Handler, Pick and Roll-Roll Man, etc.) and their efficiency for each of those play types.

The method of hierarchical clustering separated the players based on the percentage of possessions used on each play type. It outputs a graph (below) which shows how similar each player is.

Major Offensive Player Types
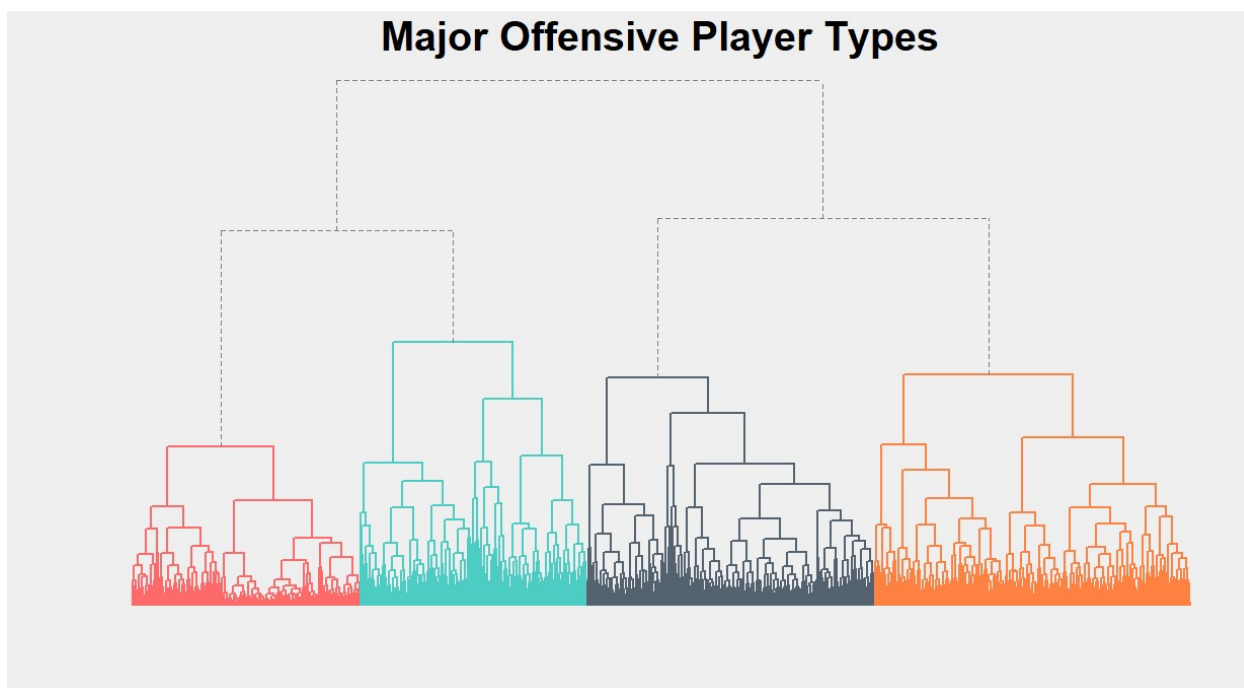
Each player is represented by a point (called a leaf) at the bottom of the graph, and they are all connected by lines, called branches. The higher the branch, the more different the group of players that it is connecting are.

We can see with the Synergy data that there are 4 well defined positions on offense in college basketball. Bigs (pink), Wings (light blue), Ball Handlers (dark blue), and what I am calling Hybrids (orange).

We can confirm this by looking at the averages of percent of possessions used by play type for each of these major position categories.

Major Offensive Player Types
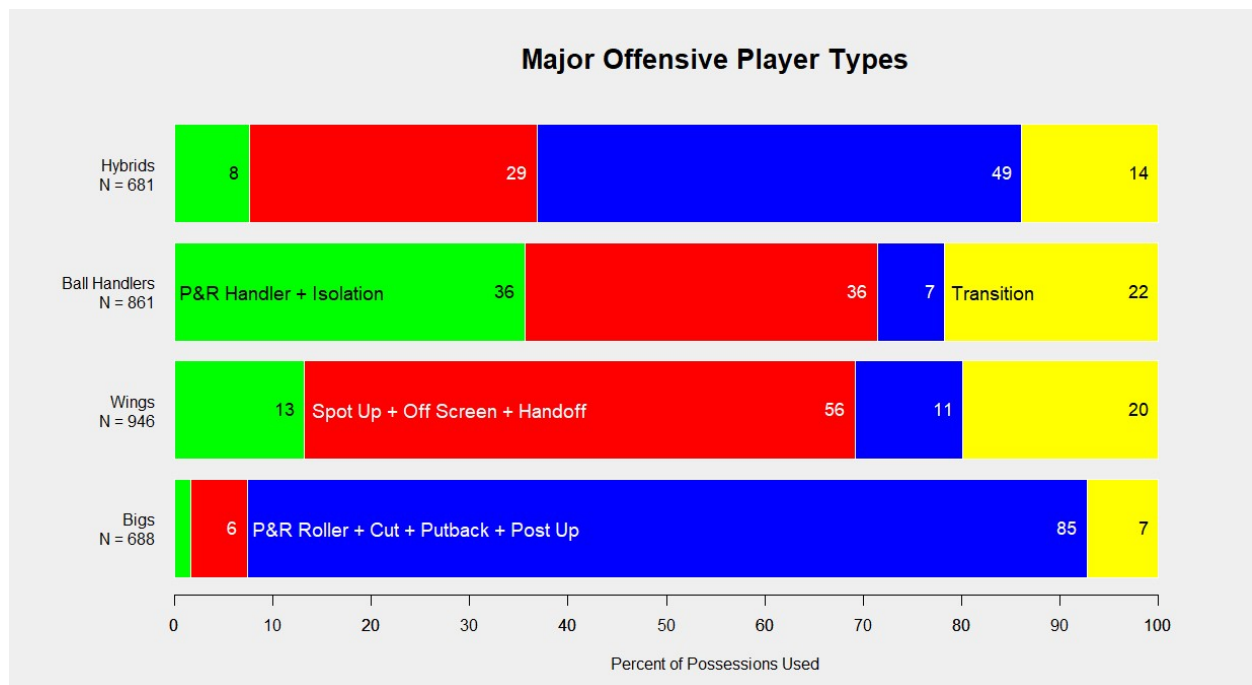
As expected, Bigs most often score as the roll man in a pick and roll, off cuts, off putbacks, and in the post. Wings score a majority of their points off spot ups, off ball screens, and handoffs. Ball Handlers score more points as the ball handler in pick and rolls and in isolation than the other positions. And finally, the Hybrids, who score in similar manners as wings and bigs, and also seem to be capable as primary ball handlers at times.

These major offensive roles can be further broken down into different roles by going back to the hierarchical clustering.

Bigs Offensive Roles
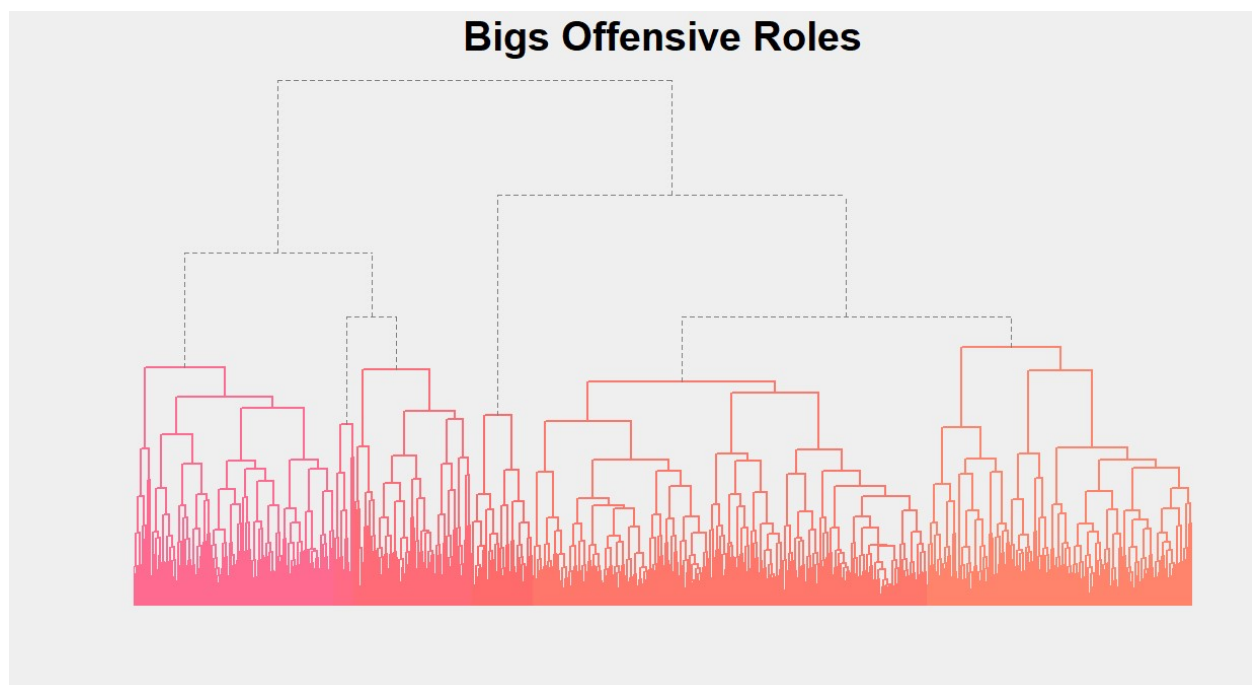
Here we can see the Bigs being broken down into 6 different roles. By looking at the average percent of possessions used and some of the players in each role, we can assign a label to the role.

Bigs Offensive Roles
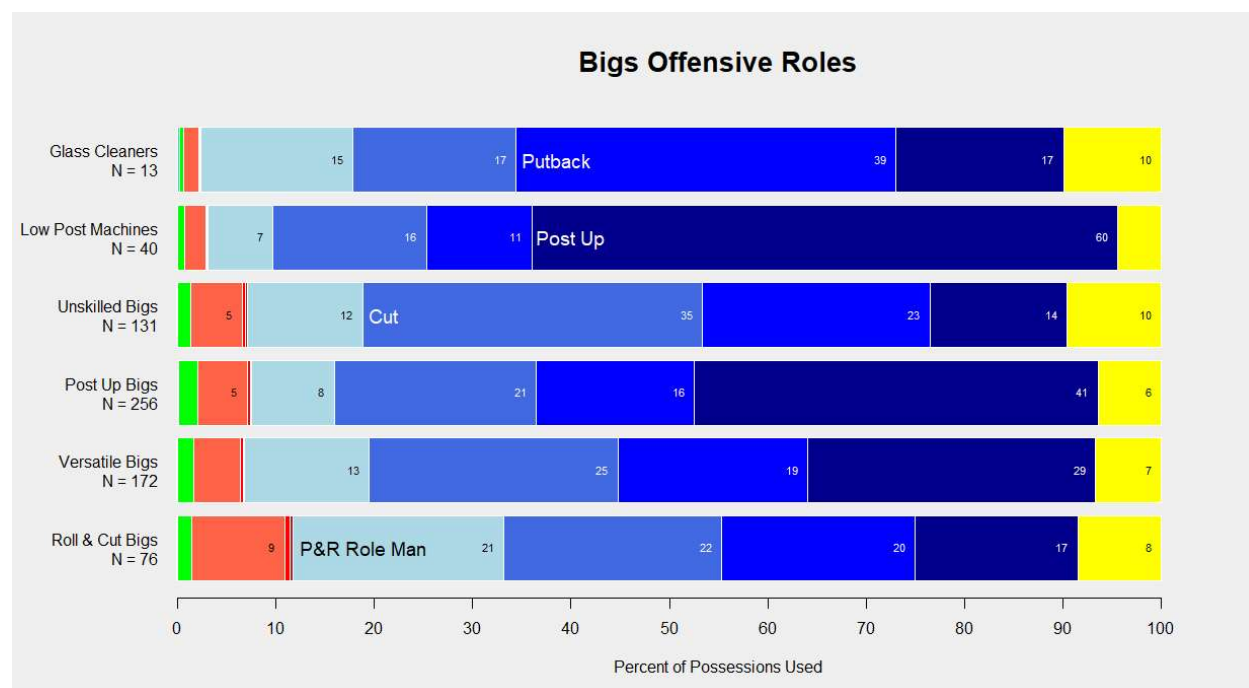
Glass Cleaners: This group scores more off putbacks than any other role. They are also very limited in term of scoring in the post and off cuts. These players are often used for their high-energy play on defense, but are not relied on to score on offense. This is a small group of only 13 players, which is a result of most teams wanting all 5 players on the floor to be able to score in some capacity.
Examples: Austin Torres (Notre Dame), Darnell Tillman (UMKC),
           Valentine Izundu (Sand Diego State)

Low Post Machines: This is also a relatively small group. These players are often much larger than their counterparts and use their size to their advantage by bullying smaller post players in the paint. However, their great size means that they are less mobile, and therefore less likely to score off putbacks or as the roll man in a pick and roll. They score in the post more often than any other group.
Examples: Przemek Karnowski (Gonzaga), Isaac Haas (Purdue),
           Udoka Azubuike (Kansas)

Unskilled Bigs: This group relies heavily on guards and wings, as they score most often off cuts which are created by ball handlers who attack downhill. They also score a good amount off putbacks, which require a shot by another player first. This group is limited in terms of their ability to score in the post.
Examples: Thomas Welsh (UCLA), Justin Tillman (VCU), Obij Aget (New Mexico)

Post Up Bigs: This group is the largest of the Bigs and contains some of the most skilled post scorers. They are generally smaller (in height or weight) than the Low Post Machines, and this allows them to also score on cuts and on putbacks. This group also demonstrates some ability to face up and shoot over defenders in the post.
Examples: Zach Collins (Gonzaga), John Collins (Wake), Tyler Davis (Texas A&M)

Versatile Bigs: This group represents a very valuable group of players, as Versatile Bigs are capable of setting screens and rolling, scoring in the post, and scoring off putbacks. The better players in this group are some of the most efficient scorers in the country. They are often the product of playing on a team with a dominant backcourt.
Examples: Darryl Reynolds (Villanova), Amile Jefferson (Duke), Tony Bradley (UNC)

Roll & Cut Bigs: This group scores as the roll man in pick and roll situations more than any other role. They are important for the modern ball screen centric offense and are judged more so on their ability to set and defend ball screens than their ability to score in the post. This group also show the ability to spot up and score from time to time, most likely from probing around the soft spots in the middle of a zone.
Examples: Devontae Cacok (UNC-Wilmington), Sidy Djitte (Clemson),
            Carlton Bragg (Kansas)

Wings Offensive Roles
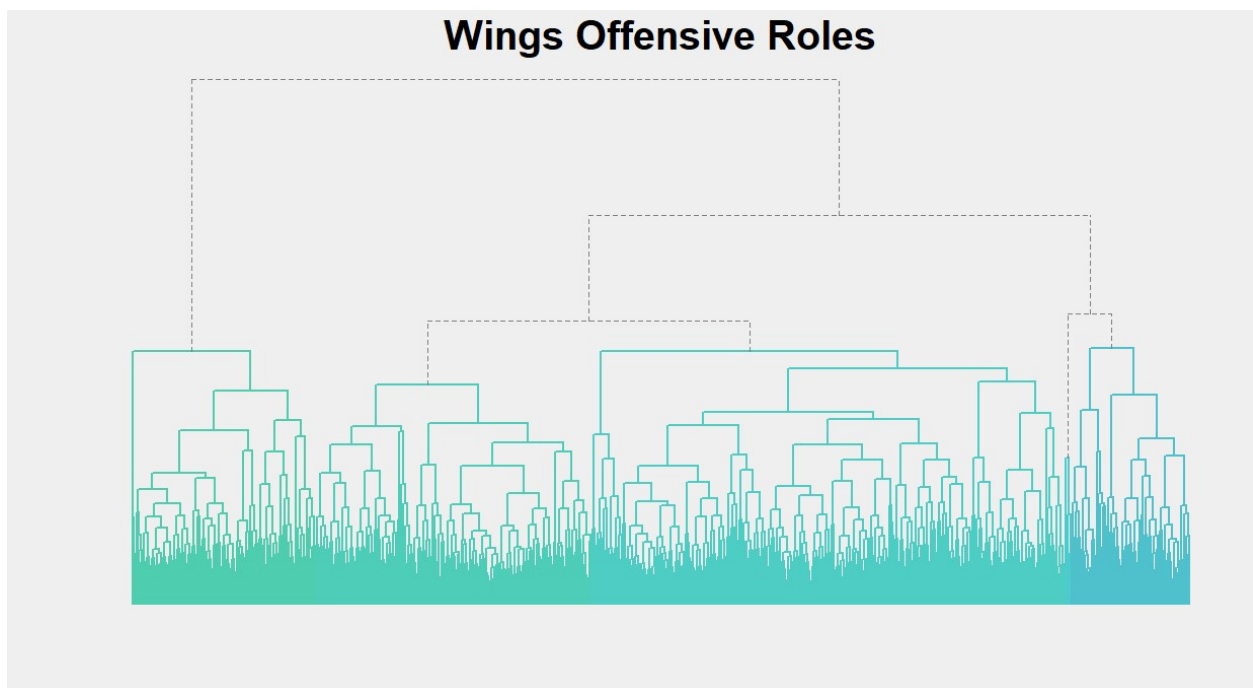
The Wings can be broken down in the same manner, into 5 different roles. The group furthest to the left is the Spot Up Shooters who quite different from their Wing counterparts.

Wings Offensive Roles
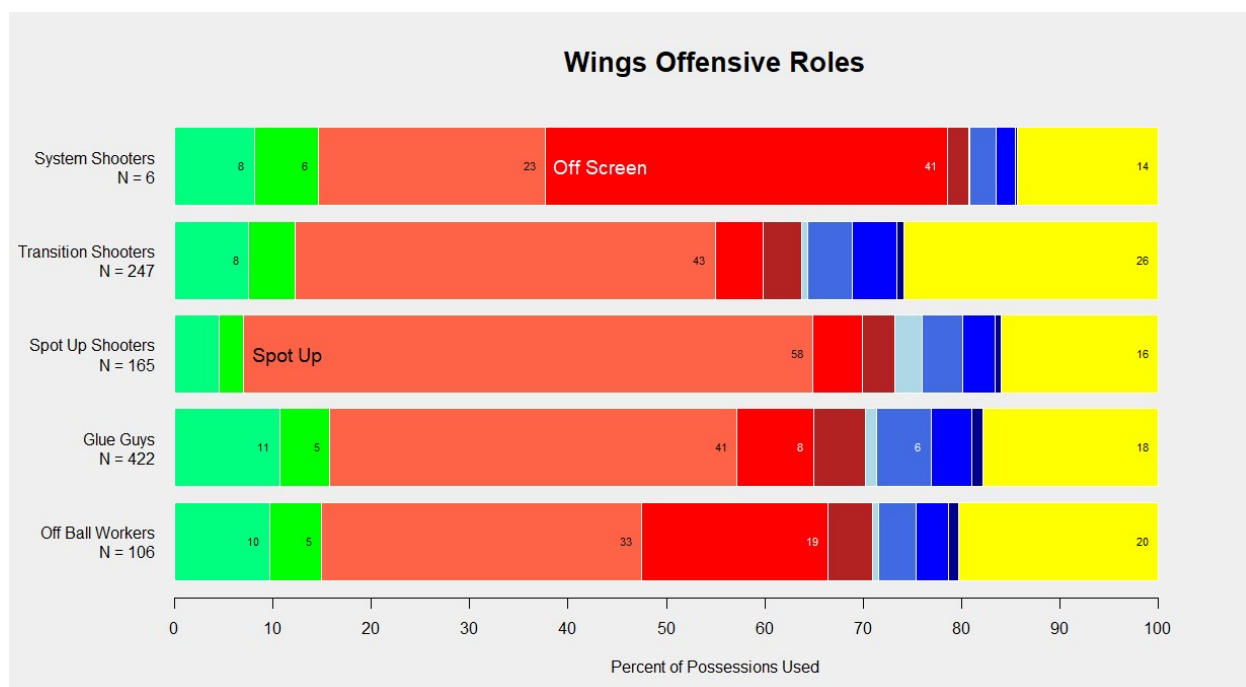
System Shooters: This is a very small group, containing only 6 players. These are guys that score in a well-defined offensive system. They rely on what they have worked on in practice, running though actions, almost exclusively.
Examples: Kyle Guy (UVA), Jaylon Brown (Evansville), Jared Brownridge (Santa Clara)

Transition Shooters: This group is similar to all of the other Wing roles in that they want to be spot up shooters first. Where this group is different is their ability to get out on the break and attack. They are often the first man down the floor in transition either attacking the basket or sitting in the corner waiting for a pass to launch a 3.
Examples: Mikal Bridges (Villanova), Phil Forte (Oklahoma St),
         James Blackmon (Indiana)

Spot Up Shooters: This group used more than half of their possessions spotting up for shots. Although limited in many other aspects of the game, they are very valuable as they cause the defense to spread the floor and create space for other players.
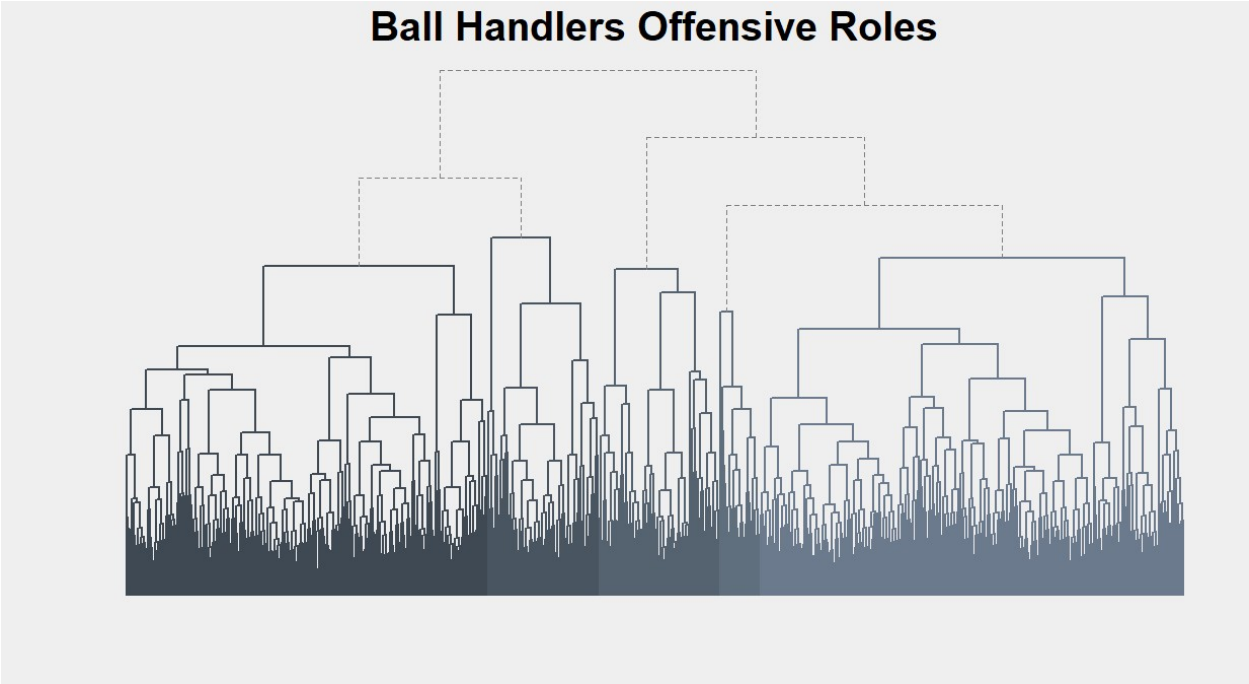Examples: Ty Outlaw (VA Tech), Corey Johnson (Harvard), Derek Willis (Kentucky)

Glue Guys: This group is defined as players that are able to fill different roles for their teams. While they are primarily spot up shooters, they have shown the ability to be a primary ball handler at times and even score down low at other times. This is the largest group for the wings
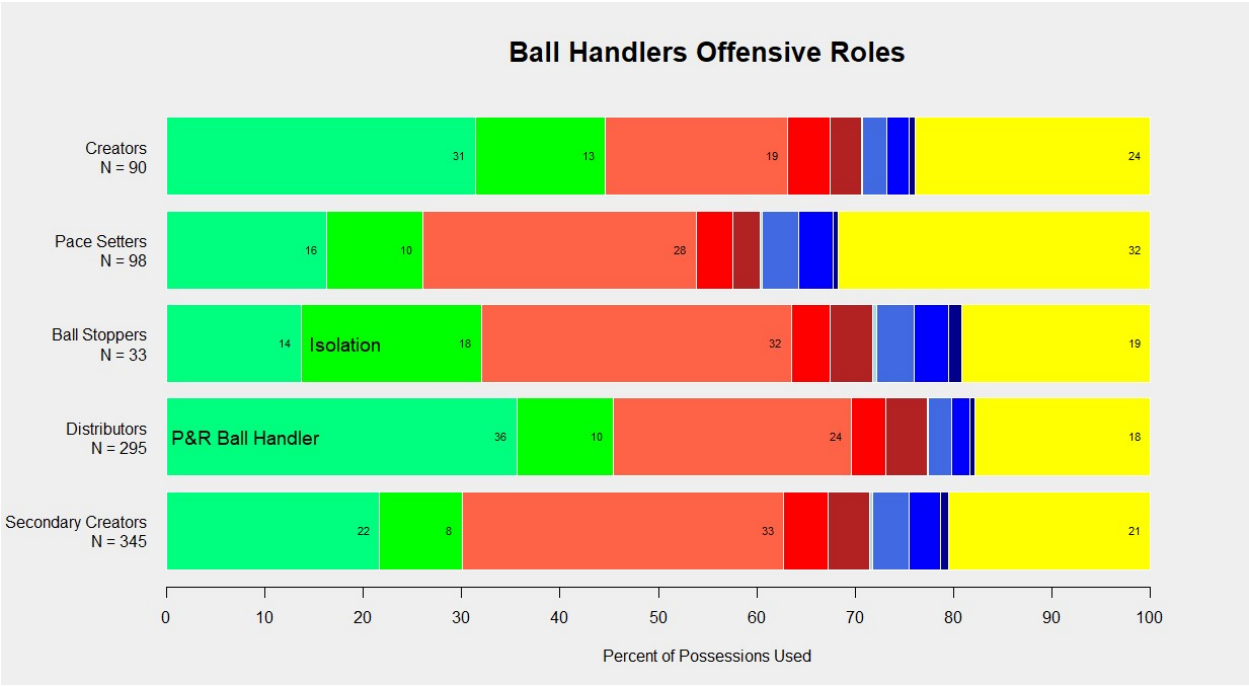Examples: Ryan Kemrite (Liberty), Rayjon Tucker (FGCU), Andrew White (Syracuse)

Off Ball Workers: This group scores in situations where they use off ball screens to get open more often than any other role (outside of the System Shooters). They find space by constantly moving and causing their defenders to work harder to stay with them.
Examples: Duncan Robinson (Michigan), Luke Kennard (Duke), Bryce Alford (UCLA)

Ball Handlers Offensive Roles

The Ball Handlers were broken down into 5 groups.

Ball Handlers Offensive Roles

Creators N = 90	31 13 19 24	
Pace Setters N = 98	16 10 28 32	
Ball Stoppers N = 33	14 Isolation 18 32 19	
Distributors N = 295	P&R Ball Handler 36 10 24 18	
Secondary Creators N = 345	22 8 33 21	

Percent of Possessions Used

Creators: This group is home to some of the best players in the country. They can be defined as players whose ability to attack the basket and score in isolation creates opportunities for their teammates. The players in this group are generally capable shooters, but prefer to attack close outs and put the defense in rotation.
Examples: Frank Mason (Kansas), Nigel Williams-Goss (Gonzaga),
            Markelle Fultz (Washington)

Pace Setters: This group contains players that are capable scoring in pick and roll, isolation, and spot up situations. However, their greatest asset is their ability to push the tempo and attack in transition. These players are generally the primary ball handlers for some of the fastest offenses in the country.
Examples: Lonzo Ball (UCLA), Marcus Foster (Creighton), DeAaron Fox (Kentucky)

Ball Stoppers: This group of players looks to score in isolation more than any other role. They often look to take their defender off the bounce and get to the rim or score in mid-range. This is a small group because of the emphasis being put on "pace and space" in the modern game.
Examples: Tyler Hall (Montana St), Aaron Holiday (UCLA), Jayson Tatum (Duke)

Distributors: This group can be defined by their willingness to pass to an open teammate for a better shot. Similar to the Creator, but they are more likely to call for a ball screen to put the defense in rotation than to attack in isolation. This is where you will find most of your other primary ball handlers.
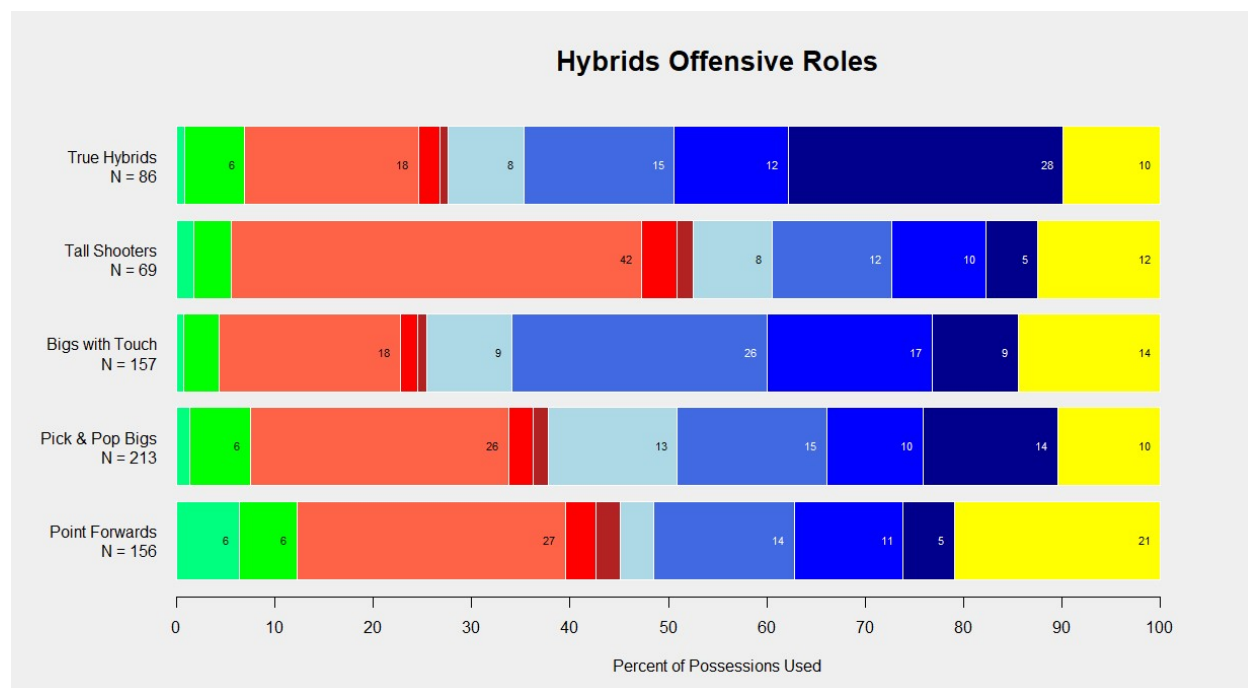Examples: Markus Howard (Marquette), Conner Frankamp (Wichita St),
            Derrick Walton (Michigan)

Secondary Creators: This group also contains some of the best players in the country. The obvious major difference between the Creators and the Secondary Creators is the Secondary Creators' greater frequency of shooting spot up shots. This is usually due to the presence of one or more other ball-dominant players on the team. These players generally operate off the ball initially but then become the primary or secondary ball handlers for their team.
Examples: Riley LaChance (Vanderbilt), Josh Hart (Villanova), Allonzo Trier (Arizona)

Hybrids Offensive Roles
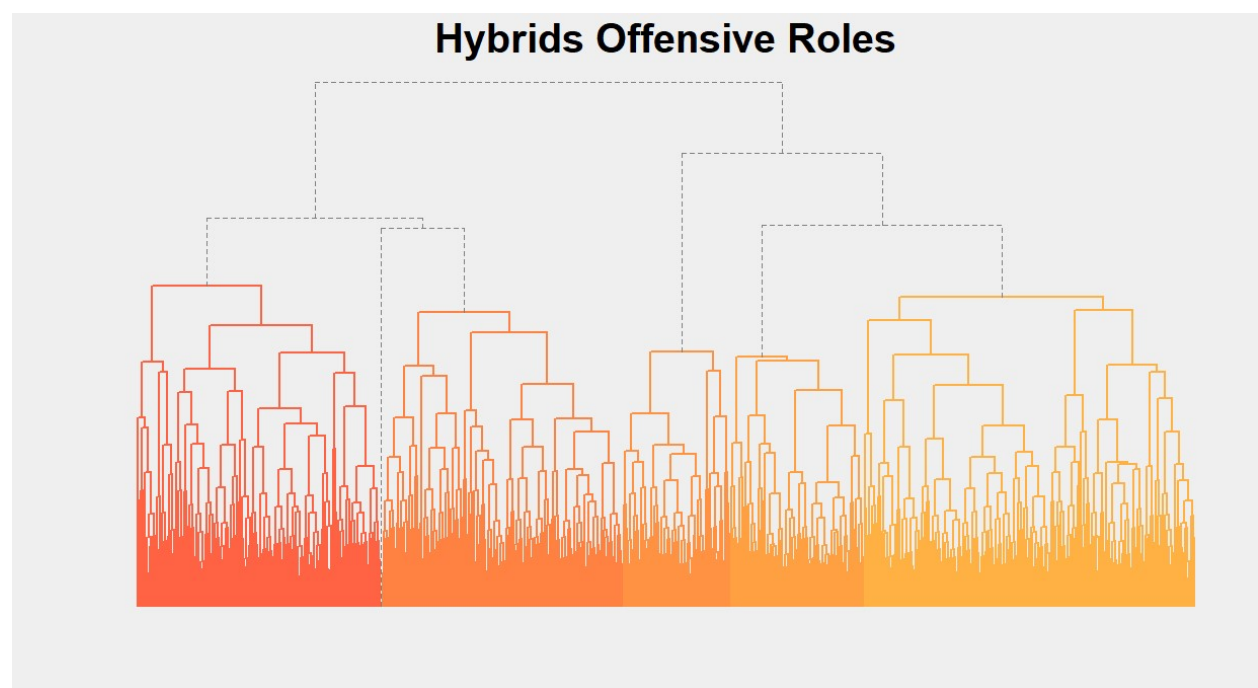
Finally, the unicorns of the college basketball world. The Hybrids are grouped into 5 different roles.

Hybrids Offensive Roles

Role		
True Hybrids N = 86	6 / 18 / 8 / 15 / 12 / 28 / 10	
Tall Shooters N = 69	42 / 8 / 12 / 10 / 5 / 12	
Bigs with Touch N = 157	18 / 9 / 26 / 17 / 9 / 14	
Pick & Pop Bigs N = 213	6 / 26 / 13 / 15 / 10 / 14 / 10	
Point Forwards N = 156	6 / 6 / 27 / 14 / 11 / 5 / 21	

Percent of Possessions Used

True Hybrids: The True Hybrids possess the abilities of a post scorer and a wing scorer. Equally comfortable scoring on the block or as a spot up shooter. They also demonstrate an ability to take their (usually larger and slower) defender out to the perimeter and attack them in isolation.
Examples: Mike Daum (SDSU), Jordan Bell (Oregon), Bonzi Colson (Notre Dame)

Tall Shooters: This group is similar to the Spot Up Shooters with their affinity towards spot up situations. However, the Tall Shooters are significantly taller than most wings and use their height to their advantage, whether it is shooting over defenders, or crashing the offensive boards and cutting to the basket.
Examples: DJ Wilson (Michigan), Kenrich Williams (TCU), Justin Jackson (Maryland)

Bigs with Touch: This group is defined as bigs who prefer to face up in the post or catch on the perimeter and attack or shoot. These players benefit greatly from having dominant backcourt play to give them space to move off the ball.
Examples: TJ Leaf (UCLA), Juwan Morgan (Indiana), Justin Patton (Creighton)

Pick & Pop Bigs: These players have a propensity to pop after setting ball screens. They have the ability to score in spot up and pick and roll situations. These very valuable bigs cause the defense to alter the way they guard ball screens to defend against open 3s for these players. Many of these skilled bigs demonstrate some ability to score in the post as well.
Examples: Lauri Markkanen (Arizona), Semi Ojeleye (SMU), Mo Wagner (Michigan)

Point Forwards: This group contains some of the most athletic players in the country. They are defined by their ability to score in a multitude of ways, not favoring one way more than any of the others. Point Forwards are valuable for their versatility. Many of them can spot up, and crash the offensive boards, along with slashing to the basket and handling the ball. Depending on personnel, these players can become primary ball handlers for their teams.
Examples: OG Anunoby (Indiana), Chris Clarke (VA Tech), Miles Bridges (Michigan St)

A couple of things to note. The players chosen for the examples are among the most efficient scorers (in terms of points per possession) in their roles, this is why they were chosen as examples for their groups. On top of that, the appearance of several players from certain teams (Villanova, Michigan, Duke) shows that these are some of the most efficient teams in the nation in terms of scoring.

Here I have put all of the roles together for easier comparison. The chart reads from top to bottom: Hybrids, Ball Handlers, Wings, and then Bigs.
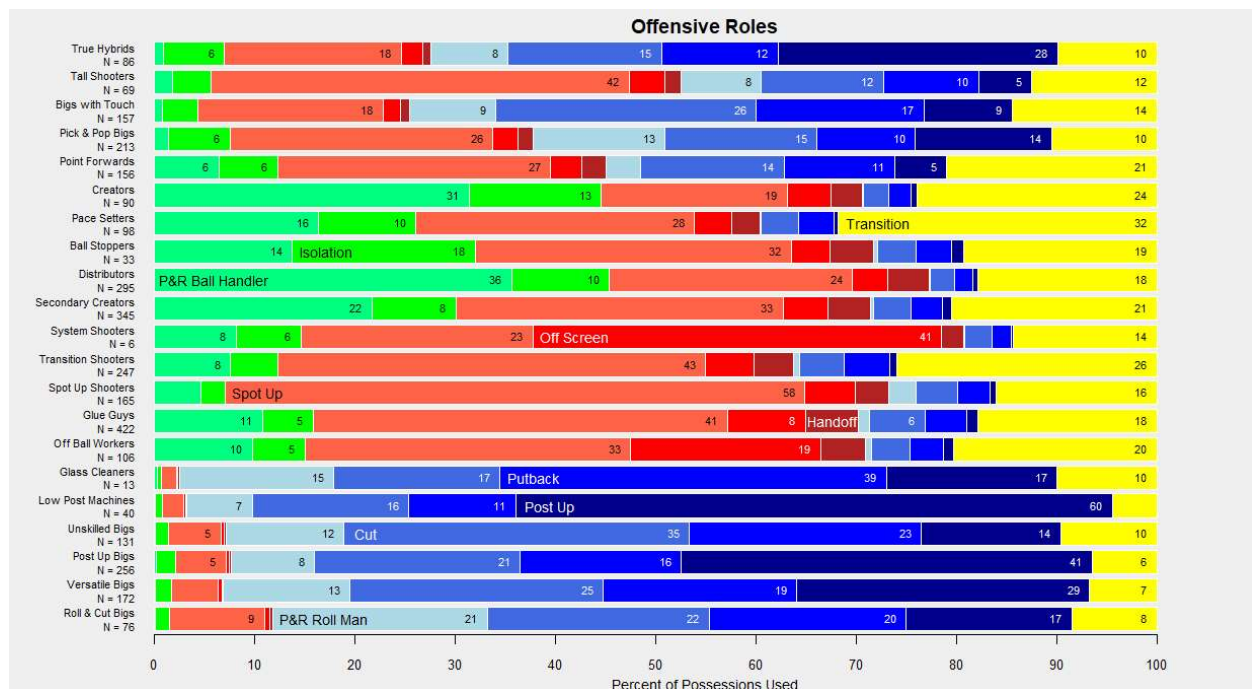
Based on this information, we can see that perhaps we should start thinking of positions in basketball differently. Instead of the standard (point guard, shooting guard, small forward, power forward, center), maybe we should be substituting our 4 major positions (ball handlers, wings, bigs, and hybrids) and then defining them by one of our 21 roles that we have defined (at least on offense).

This can lead to us using these roles in terms of lineup balance, and even in determining ideal style of play.

Richmond Spiders Offensive Roles

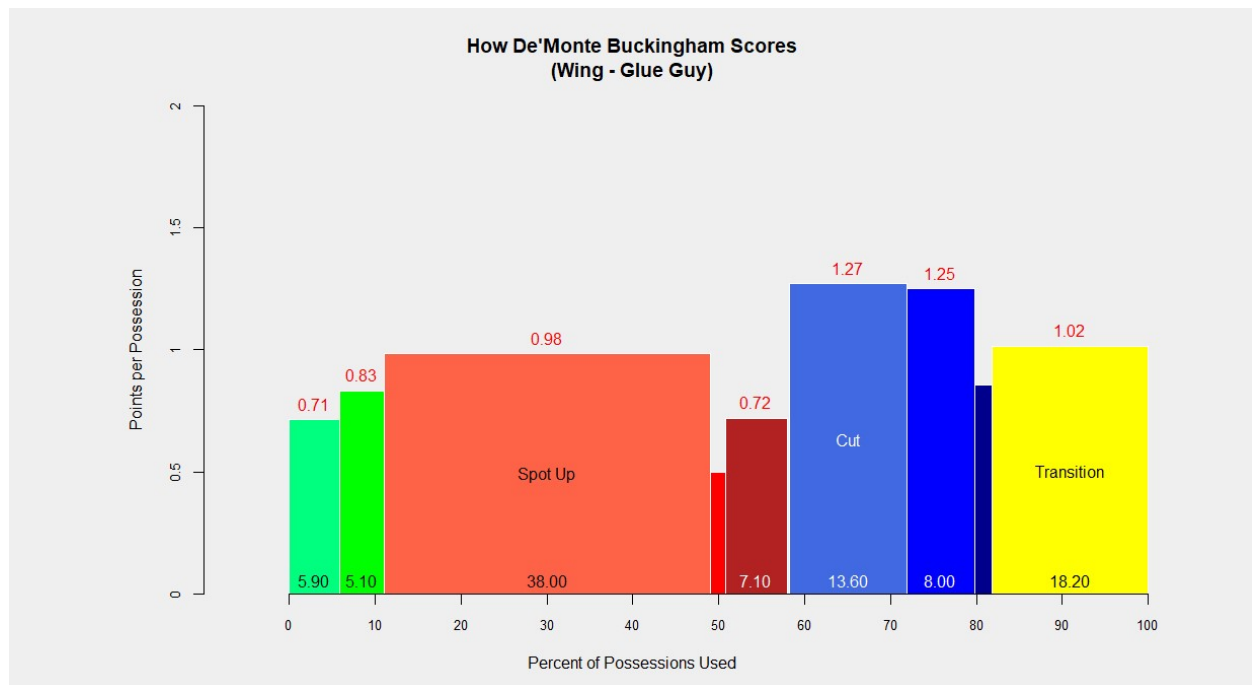The 2016-2017 Richmond Spiders can be defined using our offensive roles in the following way.

Bigs
(None)

Wings
Julius Johnson: Glue Guy
Marshall Wood: Glue Guy
Nick Sherod: Glue Guy
DeMonte Buckingham: Glue Guy

How De'Monte Buckingham Scores
(Wing - Glue Guy)

Points per Possession (y-axis), Percent of Possessions Used (x-axis)

Play Type	Points per Possession	Percent of Possessions
(green)	0.71	5.90
(green)	0.83	5.10
Spot Up	0.98	38.00
(red)	0.72	7.10
Cut	1.27	13.60
(blue)	1.25	8.00
Transition	1.02	18.20

This graph shows how DeMonte Buckingham scored last season. The width of each bar represents the percent of his possessions used for each play type. The height represents his points scored per possession for each play type. We can tell that DeMonte was very efficient using cuts to the basket off the ball. This can probably be attributed to his practicing these types of plays in Richmond's Princeton style offense. The fact that there are 4 players on the team that are classified as Glue Guys speaks to Richmond's reliance on some of their other players, namely TJ Cline and ShawnDre Jones. The Glue Guys are able to adapt to what the team needs, but do not excel in any one facet of the game.
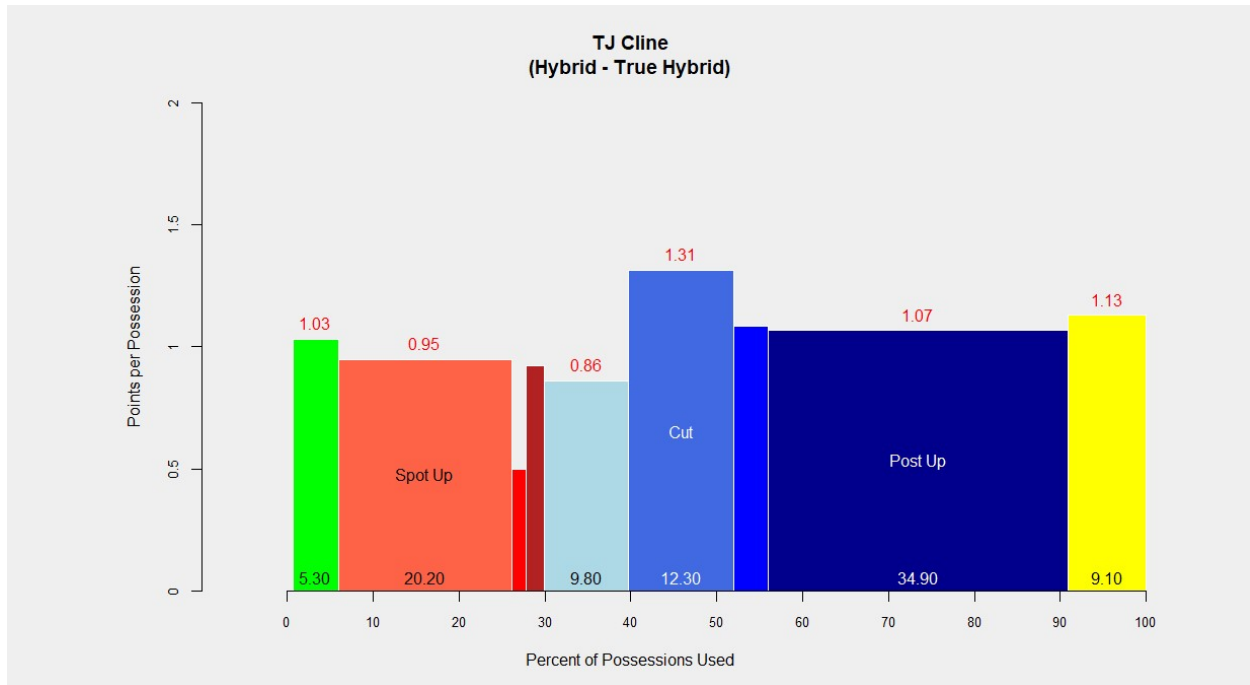
Ball Handlers
Khwan Fore: Secondary Creator
ShawnDre Jones: Distributor

ShawnDre Jones' graph shows that he most often scored in spot up and pick and roll situations, along with off handoffs. He was slightly above average in terms of efficiency for nearly every play type.

Hybrids
TJ Cline: True Hybrid

TJ Cline is a member of the Hybrid position, in the True Hybrid role. TJ is a terrific example of what a True Hybrid is, as you can see his post up and spot up bars are both very wide, along with his cut and isolation bars are wide. This shows how versatile TJ was on the offensive side of the floor. He was above average in nearly every play type that he consistently went to, with the exception of spot up situations, where he was slightly below average.